ENGINEERING NEWS-RECORD

JAN. 21, 1960

VOLUME 164 NUMBER 3
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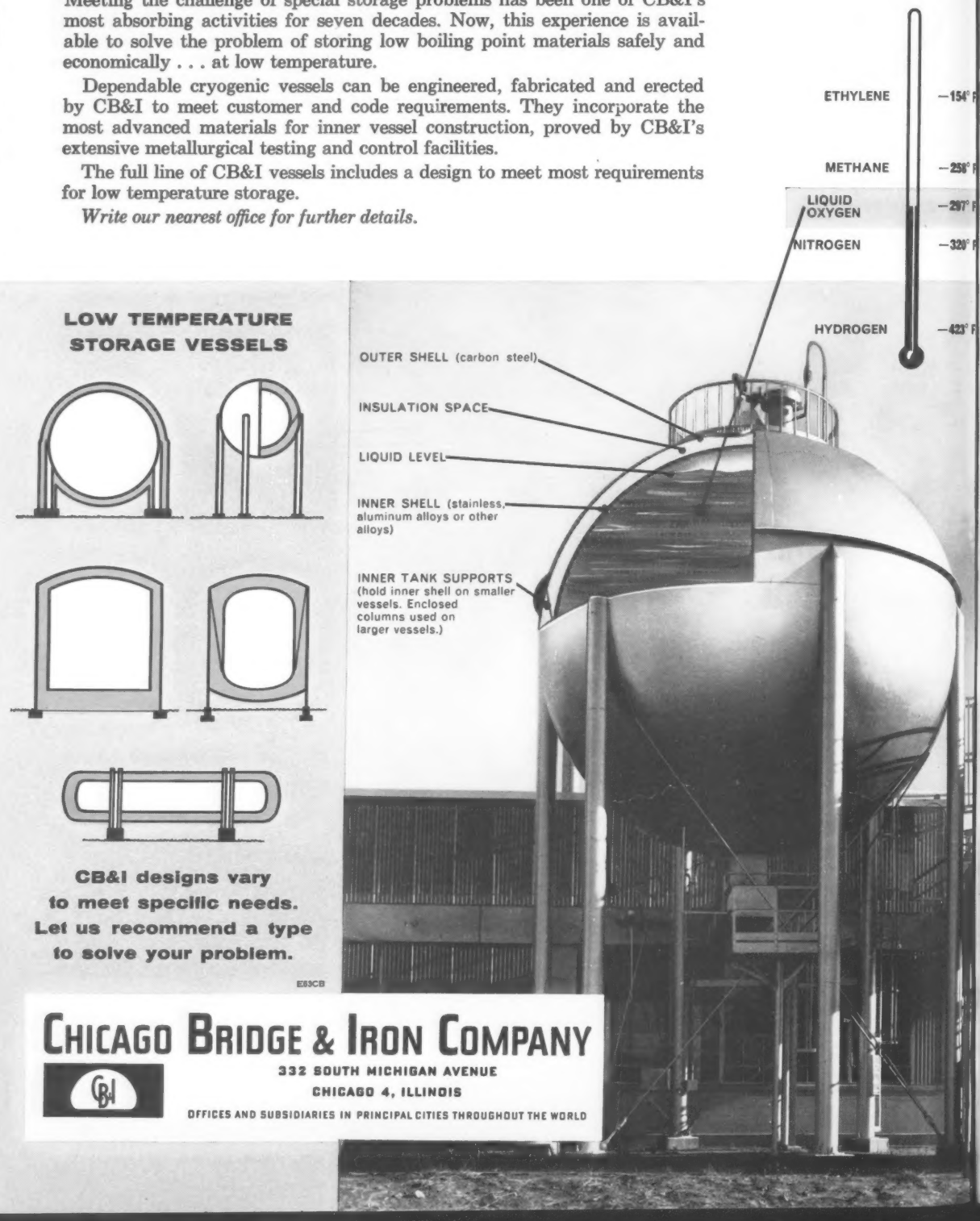

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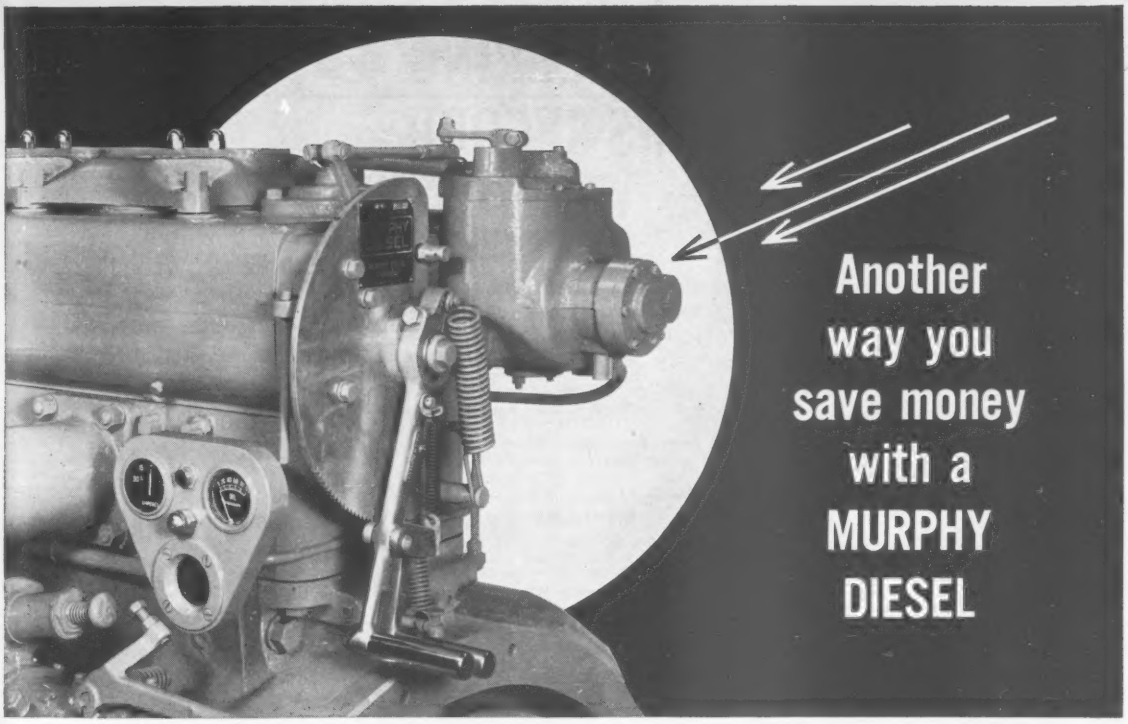

HYDRAULIC SERVO-TYPE GOVERNOR pays off in profit

OTHER MONEY-SAVING MURPHY FEATURES

UNIT FUEL INJECTORS precisely control fuel injection, permitting "true" diesel operation. Starting is easier and operation smoother.

PLAIN, OPEN COMBUSTION CHAMBERS assure *complete* combustion for maximum power from each drop of fuel with less engine wear.

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assures instant response to load change protects engine from damage

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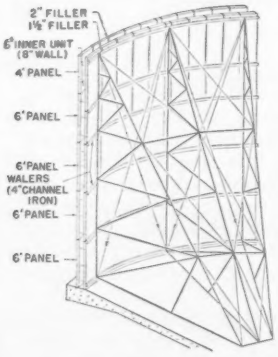
New Use for Symons Steel-Ply Forms

28′ Circular Walls Ganged for Sewage Plant

Friebel & Hartman, Shelby, Ohio contractor, with the use of a crane was able to strip and reset 2,300 square feet of forms on inside gang section in 3½ hours. And 8 men in less than 8 hours erected 2,300 square feet of forms and scaffolding on outside plus pouring the concrete. The project was the Mansfield, Ohio Sewage Treatment Plant, which consisted of four digestors.



Four ganged sections were used—each 22 feet wide and 28 feet high. This allowed pouring ¼ of a tank at a time, and a pour every four working days. Weight of each ganged form was about four tons. A ¾ yard Lorain with an 80′ boom handled the sections.

Complete story on the Ohio Sewage Treatment Plant will be sent FREE upon request. Symons Forms may be rented with purchase option.

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THE job is a pipe line in New Jersey. H. C. Price is the contractor and "Mike" Arsenich, in the 25-D Northwest Pullshovel, is clearing out rocky plugs that stopped a trencher and another make of Pullshovel. Another such plug is visible in the distance. When other equipment is stopped, the Northwest gets the job done.

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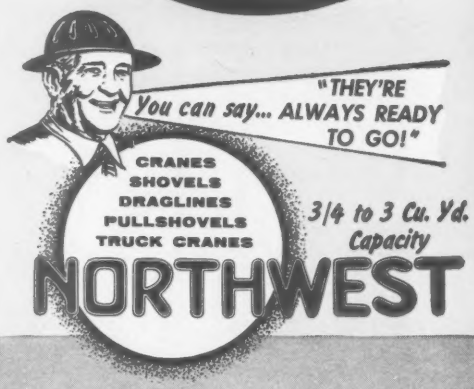

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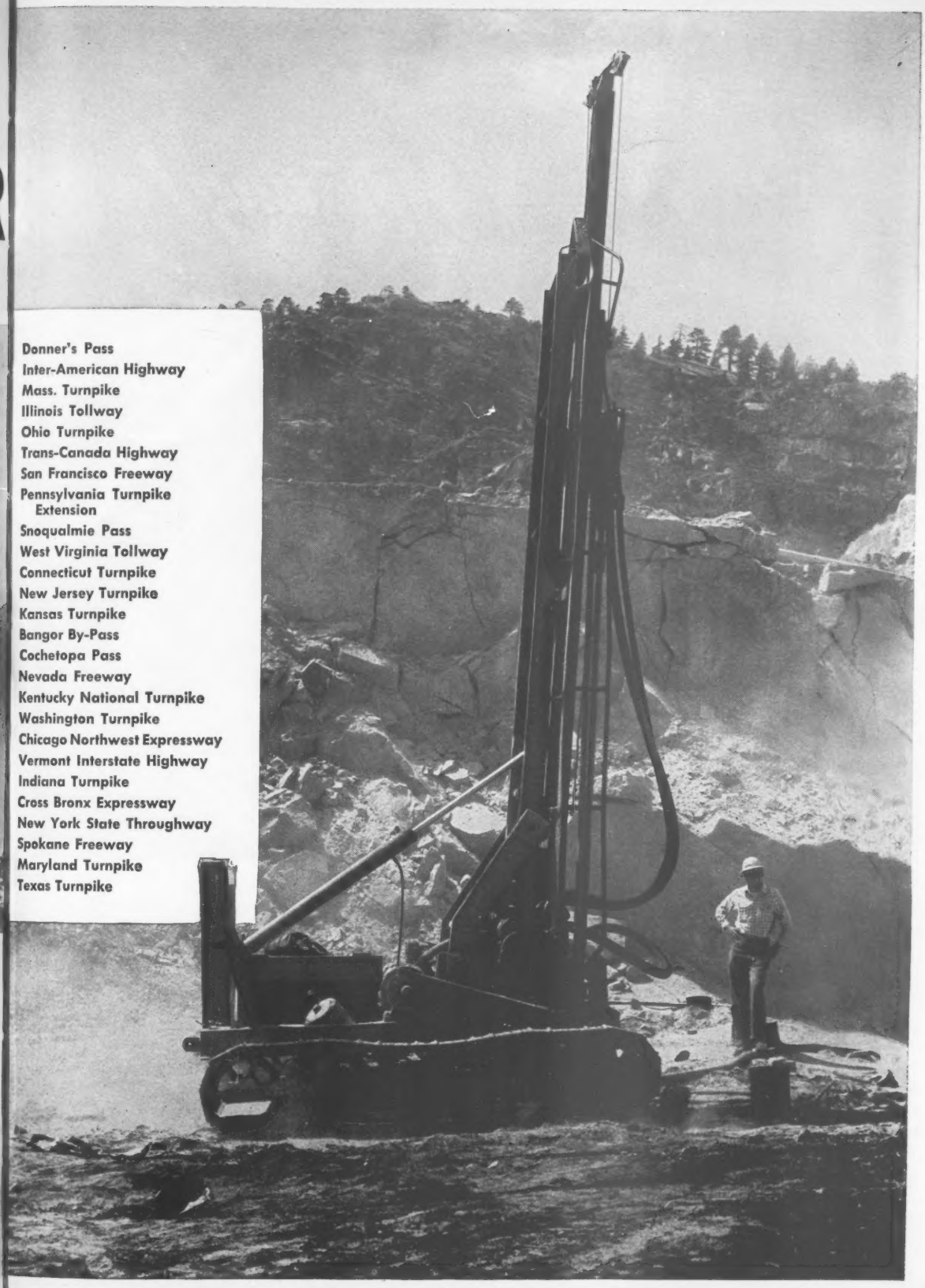

Donner's Pass
Inter-American Highway
Mass. Turnpike
Illinois Tollway
Ohio Turnpike
Trans-Canada Highway
San Francisco Freeway
Pennsylvania Turnpike Extension
Snoqualmie Pass
West Virginia Tollway
Connecticut Turnpike
New Jersey Turnpike
Kansas Turnpike
Bangor By-Pass
Cochetopa Pass
Nevada Freeway
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They'll advise the best tire and the best buy for each phase of the work—from a complete line of specialized big tires.

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WHAT ON-JOB SERVICE IS NEEDED—If desired, Goodyear Big-Tire Specialists also will set up a tire-maintenance program to save man-hours, machine-hours and tire life. Say the word, and Goodyear Contractor Service will stay on the job with you—take care of all your tire maintenance and repair needs.

Plus—BIG-TIRE PERFORMANCE
Example: SUPER ROAD LUG

Here's the great "go-anywhere" tire that's designed to keep going strong under the most brutal conditions—still be in good shape long after ordinary tires have quit. With its 50% greater nonskid tread and super-tough, new cut-resisting rubber compounds, SUPER ROAD LUG is built to perform better and far longer than other heavy-duty tires—yet costs no more to start with. Get the whole story from your Goodyear dealer—or write Goodyear, Truck Tire Dept., Akron 16, Ohio.

Road Lug—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

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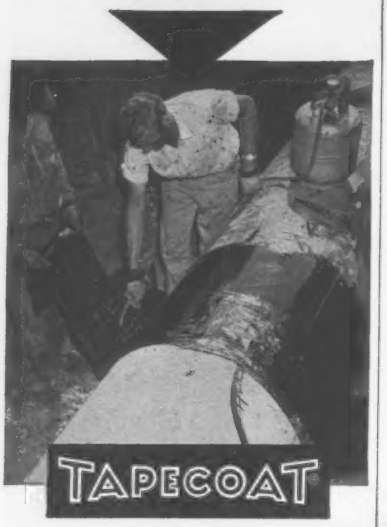

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Reader Comment

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8.00 BUS
14.00 TRUCK COMBINATION MORE THAN 5 AXLES
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11.00 TRUCK COMBINATION 4 AXLES
10.00 TRUCK COMBINATION 3 AXLES
8.00 3 AXLE TRUCK SINGLE UNIT
7.00 2 AXLE TRUCK W/6 TIRES
4.25 2 AXLE TRUCK W/4 TIRES
8.00 CAR WITH 2 AXLE TRAILER OR COACH
5.75 CAR WITH 1 AXLE TRAILER OR COACH
3.25 CAR

Mackinac Bridge

. . . Can Be Complicated

SIR—Your editorial (Dec. 3, 1959, p. 120) and comments of Marvin Bogema (Dec. 24, 1959, p. 6) regarding "A Deep Secret" deserves some further comment from one who has spent thirty years in the planning of toll plazas. The problem of advising the patron of the toll to be paid has received much consideration, although I agree, it may be possible to improve conditions at some places.

If a facility is designed for only one class of vehicle, such as the parkways in the New York metropolitan area, which are restricted to passenger cars, adequate signing is possible as only one rate is applicable to all cars.

Most toll bridges and tunnels are used by a variety of vehicles, rates differing between them. The question always arises as to what rates to post and where to locate the sign so it can be read without detracting the motorist's attention from the car ahead.

The problem is multiplied when a toll road is considered. Here the toll charge is not only based on the class of the vehicle but also on the distance travelled. What rate shall be posted and from what point of entry? In order to assist the motorist, all transit tickets issued on toll roads are printed to show the toll to each exit from the point of entry where the ticket was issued. In every case which I am familiar with, the motorist need only read the ticket to determine his toll charge. In addition, the roads have gone to considerable expense to issue receipts upon request. In some cases, these are printed automatically from the validating machine, which computes the toll from the perforations.

STANLEY A. KROLL
Consulting Engineer
Jamaica, N. Y.

Pharaohs Were First

SIR—In your October 8, 1959 issue, p. 36, there appears the headline, "Pit dug for an underground pumping station features an innovation: Concrete Wales Brace Circular Cofferdam."

Since to innovate is defined as to introduce something new, the headline statement must be challenged.

In 1949, the Drilled-in Caisson Corp. (a subsidiary of Spencer, White & Prentis, Inc.) and Western Foundation Co. designed and built in Venice, Ill., a 97-ft-dia cofferdam braced by reinforced concrete circular wales. That cofferdam was also for a pumping station, the intake for a big powerhouse on the Mississippi.

ENR carried an article on the Venice cofferdam April 27, 1950, p. 32.

It seems to me that any claim for a "first," "record," "uniqueness" or "innovation" can be refuted by somebody. I now believe that anything done in construction was "first" done in the construction of the Pyramids.

ROBERT E. WHITE
Vice President
Spencer, White & Prentis, Inc.
New York, N. Y.

Case Got Ford Money, Too

SIR—I was interested to read your article on the Ford grants for engineering education but Case Institute of Technology was somehow missing from the list (ENR Oct. 29, 1959, p. 22).

Case received a grant of $1 million for its Systems Research Center and Engineering Design Center.

GEORG MANN
Director of Public Relations
Case Institute of Technology
Cleveland, Ohio

(Reader Comment continued p. 12)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

No fire catastrophe here...it's

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ALL NEW OLIVER OC-9

—the tractor that TALKS for itself!

with TRANSOMATIC drive to give you 3 types of turns...fully "powerized" operation!

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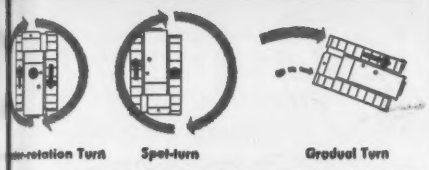
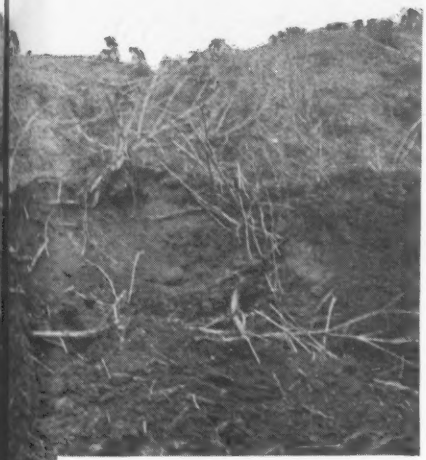
The OC-9 is *all new*, years ahead of anything else its size! It's far advanced in *every* department—in new diesel might with power-boosting torque converter drive...in the easiest operating performance you've ever enjoyed in a tractor.

Being *all* newly engineered and not an updated older model, the OC-9 is designed *in all its components* for more than the full power it packs...for the greater work it can do. In size, weight and strength of torque converter, transmission, clutches, track assembly—*all* vital working parts—the OC-9 is the most massive in its class...the most lasting.

See the progress that has come to tractor design...the profit-multiplying benefits ready for you now!



"Slam-bang test the OC-9 in your own way and let the tractor do the talking"



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The OC-9 is the *first* crawler its size having an *industrial heavy-duty* torque converter built far in excess of the toughest work-load requirements. Push or pull twice the pay loads at reduced speeds...profit from its limitless speed ratios to match any job needs.

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The OC-9's "lap of luxury" controls put easy, relaxed steering and reverse comfortably in hand with conveniently placed, power-assisted controls just ahead of the operator's seat. Only the OC-9 has full-width, flush deck for walk-in ease and leg-movement freedom.

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Take a good look at the OC-9's clean, uncluttered good looks. Here is the classic of crawler-engineering with design simplicity and *design sense* sure to enhance your company prestige on every job you give it.

See what's ahead for you in newly achieved job speed—higher-than-ever earnings...

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New 100% factory-built loader for the first time incorporates the side pedestals as *integral* parts of the tractor—not high "bolted-on" afterthoughts. No loader parts extend above the engine cowling—for clean-cut, clear-around visibility. Fast-cycle loader with deep-digging and high-reaching range has 1-yd. bucket.

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. . . Reader Comment

AGC and Education

SIR—I have belatedly read the letter from Professor Irish (ENR June 25, 1959, p. 7) on the subject of status of civil engineering as a profession and its shrinking stature.

An intensive study of the education problems involved in education for construction is being made by the Education Committee of the Associated General Contractors and by the joint cooperative committee of that organization and the American Society for Engineering Education, of which I have the honor of being co-chairman with Professor C. H. Oglesby of Stanford.

Admittedly the task of selling civil engineering is a tough one. Also admittedly the construction industry is not doing enough, not doing as much as it can and should, but it is doing far more than it was doing as recently as five years ago. It has made a real start and will continue to do more and more as it becomes increasingly aware of the need.

Have you seen the AGC's film "The Constructor," which glamorizes the career of a construction man? Do you know that most of the AGC Chapters (123), which blanket the country, have active education committees? Increasing numbers of AGC Chapters have scholarship programs, some have student loan funds and most of them have reasonably close connections with engineering colleges. More and more contractors are being named to boards and advisory committees of engineering colleges. Scores of contractors speak to student orientation groups, student chapters of ASCE and senior engineering student classes. All of these activities spell out an increasing awareness of the problem within the industry.

W. A. KLINGER
W. A. Klinger, Inc.
Sioux City, Iowa

Did Contest Help Steel?

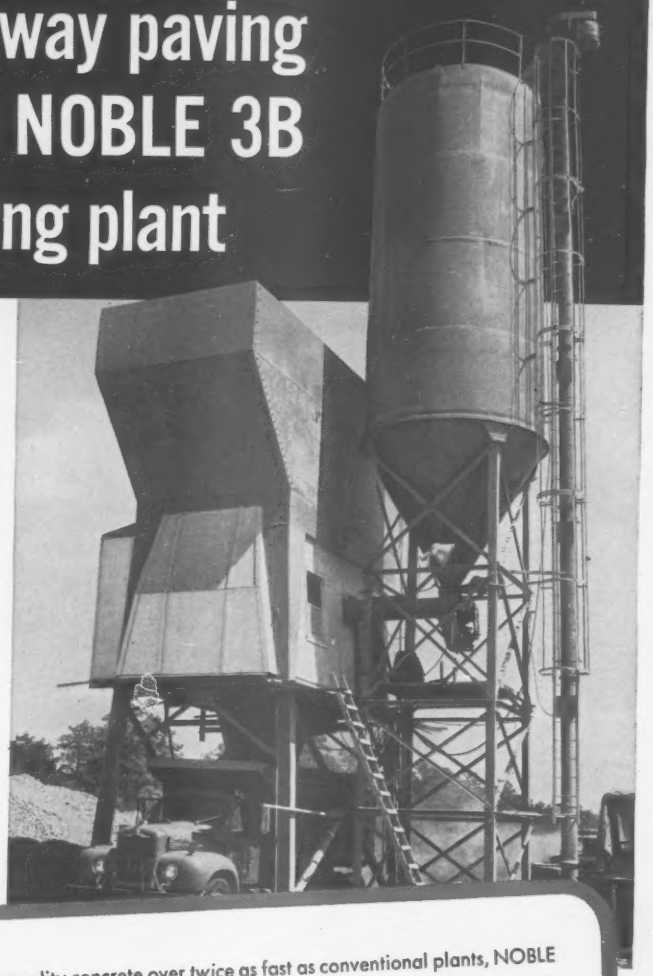
SIR—Was the sponsorship of the American Bridge contest an indication of the concern of the structural steel industry over the imminent competition with prestressed concrete in the highway program. If so, did this contest help them?

It is doubtful that American Bridge got its money's worth. The winning designs were beautiful but were not economical or competitive with prestressed concrete. Add to the initial cost the painting requirement of structural steel and you end up with designs that help further the cause of prestressed concrete.

It will be interesting to see the designs that are actually built and to look back and see their relative position in this contest.

WALTER R. HNOT
Mountainside, N. J.

Mile-a-day highway paving record set with NOBLE 3B concrete batching plant



5,394 feet of highway paving setting a new 1-day record was supplied entirely by NOBLE 3B concrete batching plant. Two dual drum pavers pouring concrete every 30 seconds on relocation of Rhode Island Routes 2 and 3 depended on an uninterrupted flow of aggregates and cement. The 1150 batches required were batched and discharged by NOBLE 3B on schedule without a hitch! With overhead aggregate storage of 150 tons and separate overhead cement storage of 500 barrels, NOBLE 3B high speed output kept 8 dry batch trucks hauling materials in a steady stream to the paving site 7 miles away. Of all batching plants familiar to the contractor, **Campanella & Cardi,** in its ready-mix concrete division, NOBLE 3B was selected for highest productivity, consistent quality and reliable, economical operation.

NOBLE 3B

3 batchers (2 for aggregates, 1 for cement) weigh materials simultaneously for a *single* batch.

Batching quality concrete over twice as fast as conventional plants, NOBLE 3B keeps pace with fast-moving paving jobs. Sub-assembled at factory, it is transported rapidly to job site and quickly erected with no outside purchase of essential components or extensive field assembly and wiring. A pair of 3B plants set up as a dual twin-driveway *single-stop* plant for airfield construction when highest output is required can later be split into 2 complete plants for separate highway paving jobs in *1-stop* or *2-stop* set-ups controlled by a single operator.

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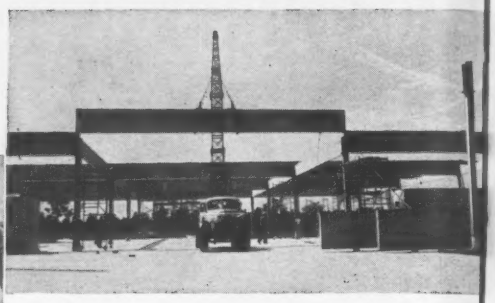
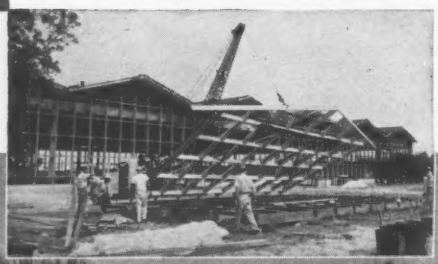
Fir plywood components n
versatile new l

Giant prefabricated 4 x 48 foot fir plywood girders were crane-lifted into position atop supporting columns.



Stressed skin fir plywood roof panels were used in pairs to form peaked roofs over 40 foot bays.

Sidewall framing was tilted into position, covered with high density overlaid Exterior fir plywood siding.



ARCHITECTS:
Ralph and William Zimmerman, AIA
Sarasota, Florida

BUILDERS:
Gilbert & Shields Constructors, Inc.
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make possible low-cost building techniques

...in 50,890 sq. ft. converting plant for International Paper Co.

One of the largest all-plywood and wood structures built since World War II, this Auburndale, Florida, plant of International Paper Company's Container Division demonstrates the outstanding technological advantage of modern plywood construction. Major key to building economies was the use of prefabricated fir plywood components.

BOX BEAMS, prefabricated of fir plywood, were one time- and money-saver. The beams, strong as steel and far lighter, have webs of 1-inch fir plywood and flanges and stiffeners of 2 x 12's. They were 4′ x 48′, and had a clear span of 40′ to support the series of eight 48-foot peaked roof bays.

STRESSED SKIN ROOF PANELS, prefabbed with plywood, were lightweight and easy to install. Each pair of panels spans 40′ to form the peaked roof over each bay. Top skin is ⅜″ fir plywood, bottom ¼″, glued and nailed to 2 x 8 framing.

EXTERIOR WALLS are ¾″ high-density overlaid fir plywood which requires no finish and is expected to be maintenance-free for the life of the building. The entire structure was completed in 154 working days. Structural members, including the fir plywood box beams, columns and girders, went up in 10 days. Stressed skin roof panels took 10 days; the siding went on in 5.

FOR INFORMATION on fir plywood component construction or other data, write

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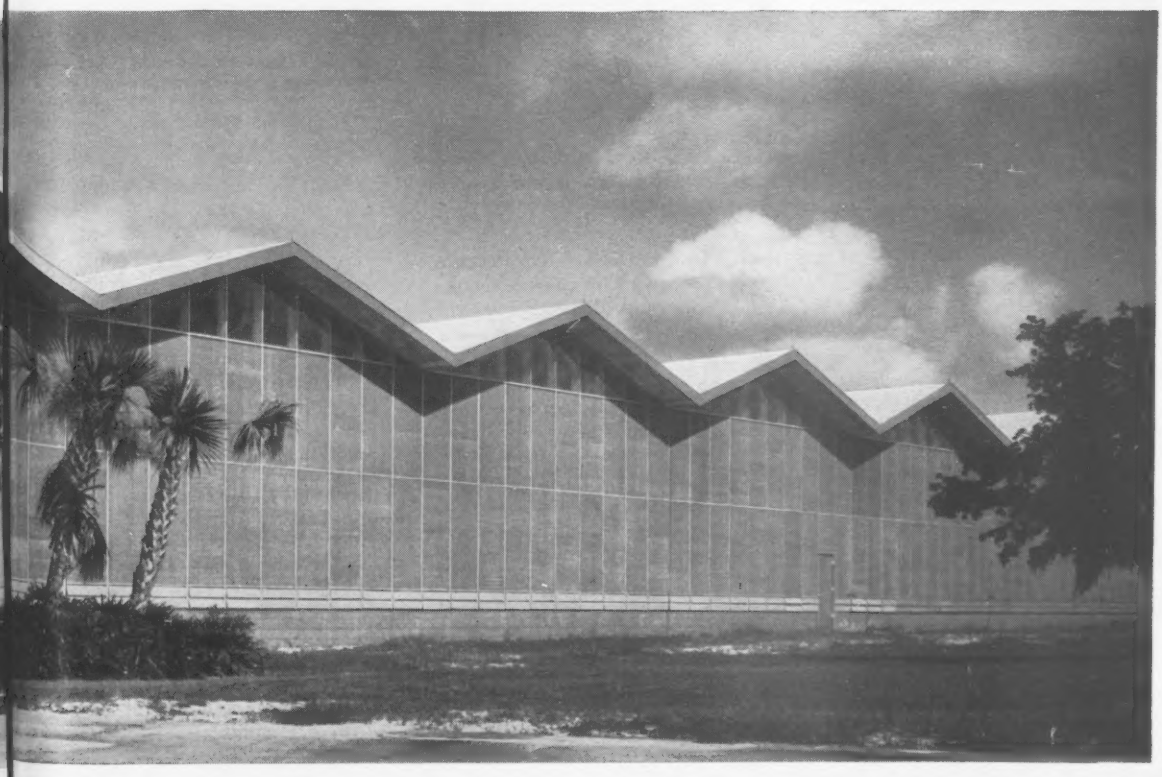
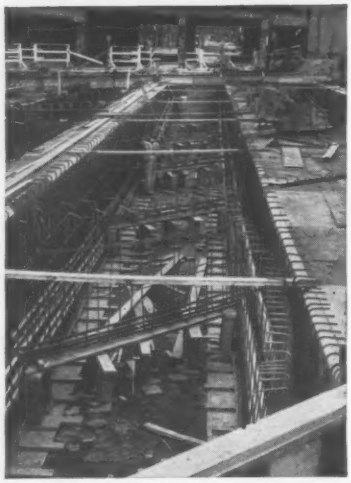


A new Ryerson service . .

POST-TENSIONING FOR REINFORCED CONCRETE CONSTRUCTION

The nation's most complete post-tensioning service is now being offered to contractors through the 20 Ryerson steel service centers coast to coast. This new service includes a complete "package": force development calculations, detailing and placement plans, complete tendon and anchorage assemblies, stressing and grouting equipment, and field labor procedures—assuring the most reliable cast-in-place or precast post-tensioned construction at minimum cost.

The patented* method for prestressing and anchoring reinforcements of concrete used by Ryerson is the time-proven BBRV system. The many advantages of this method have been demonstrated in hundreds of major European construction projects of all types over the past 15 years. Ryerson post-tensioning service also gives contractors the advantage of a single source for the fabricated re-bars, accessories and other steel requirements of the job.



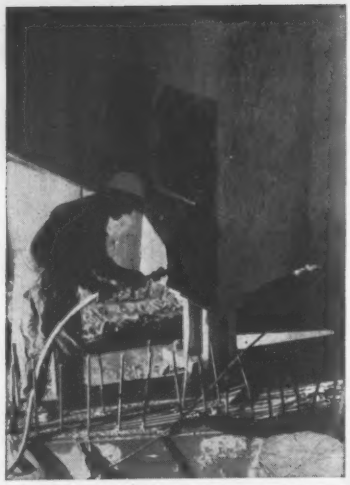
SUPPLEMENTARY REINFORCING STEEL in position around tendons, and bridge girder.

SEVEN TENDONS (six 40-wire units and one 12-wire unit) draped in position for 156-foot bridge girder.

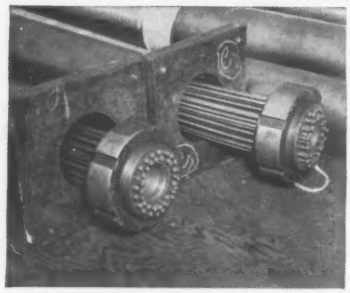
Examples of current projects using Ryerson post-tensioning service: the second deck approaches for the George Washington Bridge in New York City, Chicago's huge lake-front exposition hall, airfield pavement slabs at a California air base, a 468-foot overpass for the Northwest Expressway in Chicago (three 156-foot clear spans), the longest post-tensioned concrete bridge span in the Western Hemisphere at Oneida Lake, New York (total clear span, 320 feet).

For complete information on this new post-tensioning service or for help on specific projects, contact your nearby Ryerson plant. Specialists are available to give you all the facts, estimate costs, and show how Ryerson is equipped to improve and simplify your next construction job.

*U. S. Patent No. 2728978



GROUTING MIXTURE is forced into tendons and around wires after stressing. Pressure injectors and venting procedures assure positive filling of all casing and trumpet voids.



40-WIRE ASSEMBLIES in flexible conduit before placement—showing moveable anchor head, lock nut, base plate, and trumpet encasing last few feet of flexible conduit.

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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

CONSULTANTS TO STRIKE BACK—Strongly worded rebuttals can be expected from the American Institute of Consulting Engineers and the American Society of Civil Engineers to charges that engineering work performed by consultants is more expensive than that done by government forces. Statements to this effect by the House Appropriations Committee and the Comptroller General are considered misleading and unsupportable.

URBAN RESEARCH COUNCIL?—Chances are good for creation of an Urban Research Council within the National Academy of Sciences-National Research Council. Such a move seems more likely than an expansion of the Highway Research Board to include all forms of urban transportation (see p. 23).

MAYBE THEY INVENTED IT—Soviet Union engineers were reported last week to have erected a "prefabricated" apartment house by lifting up roofs, floors and walls of successive stories with jacks atop the building columns. Question: Will they pay royalties to the U. S. firm holding lift-slab patents?

COAL TAKES TO THE ROAD—A bituminous paving binder made from soft coal may be on the market soon. Curtiss-Wright Corp., N. J., tested it in Kentucky last year and claims the results are highly satisfactory.

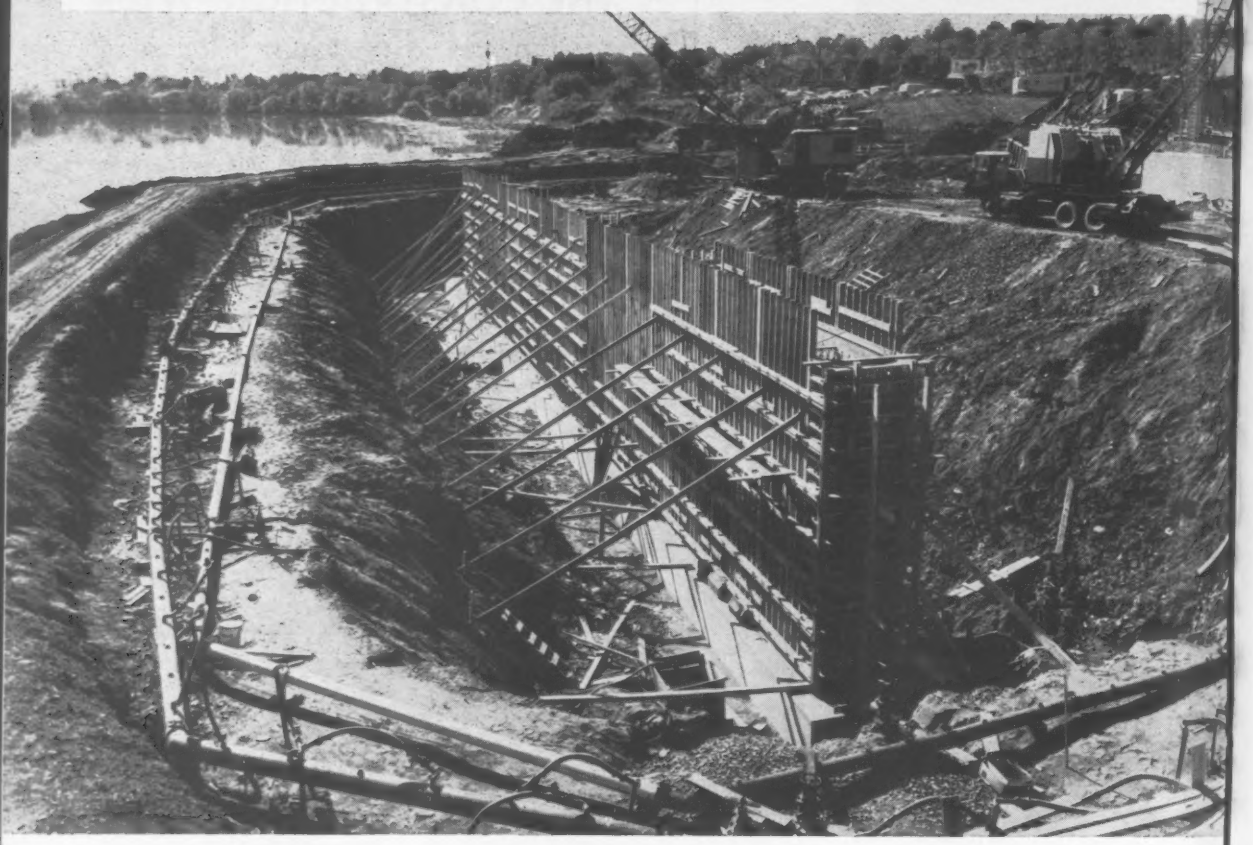
BEGINNING OF THE END?—The controversial Brown-Olds remedy, used by the National Labor Relations Board to penalize unions and contractors for illegal hiring practices, has been held unjust and nonsensical by the U. S. Court of Appeals for the Third Circuit. The court set aside the penalty in an American Dredging Co.-operating engineers case.

NEW DECK BEGUN—The first section of the lower deck for George Washington Bridge was placed early this week. A 220-ton panel, assembled on the ground beside the New York tower, was raised to a point just below the existing deck and moved sideways on rails to the east abutment (ENR June 11, 1959, p. 24).

COSTS RETREATING—A drop in lumber prices will halt the record rise in construction costs and, probably, set off a slight decline. Weather in the Douglas fir region enables heavy timber cutting. This abundant supply of fir coupled with an expected decrease in homebuilding will reduce lumber prices.

CITY RULES OUT HOT RUBBISH—Long Beach, Calif., has drawn the line at 1,800 barrels of radioactive waste. When a disposal contractor accumulated that much from the Atomic Energy Commission before getting rid of it, the city ordered him out of business.

AHEAD OF SCHEDULE . . . IN THE DRY !



Pumping Contractors: American Dewatering Corporation, Rockaway, N. J. • Owners: N. J. State Highway Dept.

MORETRENCH WELLPOINTS lower water 22′ within an earth filled dike for pier foundations — Passaic River Bridge, Paterson — East Paterson, N. J.

Rough, hard digging — plenty of rain — high river stage — *nothing* has stopped Public Constructors, Inc., Blackwood, from making exceptional progress on this difficult job:

Pumping started September 21st.
By October 30th, contractor had poured concrete for Piers No. 3 and No. 4, and for piers and abutments for two approach roads.

Material consisted of stratified sand, gravel, and river mud with hard pan at subgrade.

Efficient predraining eliminated bracing . . . furnished a free, safe area in which to work at top speed — in the dry!

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WASHINGTON OBSERVER

- **Budget fight coming**
- **More liberal depreciation allowances?**
- **Ike wants housing changes**

● **A solid commitment to tight money and spending holddowns is the key to President Eisenhower's budget** (see p. 21). The President is taking full advantage of the tremendously favorable peace-and-prosperity political climate. He is cutting back on popular construction programs to help produce an estimated $4.2-billion surplus for the year beginning next July 1.

The budget includes some new construction programs—new public works starts for which he wants construction money. But over-all, the emphasis is on balancing the books.

The $4.2-billion surplus isn't likely to be realized—even top Republicans concede that. It depends on such things as passing a postal rate increase and raising the federal tax on gasoline to pay for highway spending—increases Congress isn't likely to approve.

Also, the Democrats are bound to force spending on certain public works programs President Eisenhower wants to cut back. He wants to trim public housing, sewage treatment plants, hospital construction funds, aid to schools in federally impacted areas. The President, of course, has the veto and will undoubtedly be given a chance to use it on some or all of these items. Congress, on the other hand, is even more likely to override a veto on such popular issues—just as it overrode some last year to force new starts for public works projects.

—

● **The Administration is offering to liberalize depreciation of plant and equipment**—under a given set of circumstances. Here's how Secretary of Treasury Robert B. Anderson laid down his idea:

Congress should amend the tax laws that now allow a company to pay the 25% capital gains tax rate on income it gets from selling fully depreciated property. Secretary Anderson considers this as a loophole and wants this income taxed at the higher corporate income rate.

If Congress does this, then Secretary Anderson would instruct Internal Revenue field agents as a matter of policy to be more liberal in allowing taxpayers' claims for deductions on amortization. The idea is to actively encourage agents to rely less-and-less on the deductions allowed in Bulletin F, the outmoded IRS guidebook, and allow faster write-offs to those who can make a good case for their claims.

—

● **The President's new economic report to Congress calls for several key changes in housing laws.** He wants to increase the present 4¼% interest ceiling on veterans' and military housing programs, and place the FHA program of insurance for home improvement and repairs on a permanent basis.

The report came about the same time as a new government report showing housing starts running counter to the usual seasonal decline in December. They showed a 100,000 increase over November. HHFA Commissioner Norman Mason says the figures show there is no need for emergency legislation in Congress to stimulate homebuilding, as some powerful Democrats propose.

More **protection in depth** from Liberty Mutual

Accident victim gets quick help. Liberty claimsmen stationed all over the U.S. know the contractor's operations and specific problems. Sometimes they live right on the job.

How minutes make a difference in your costs of workmen's compensation

Every time an accident disables one of your employees, the cost is reflected in your workmen's compensation insurance rates. By preventing accidents — or lessening their impact when they do occur — Liberty's protection in depth helps you keep your rates down.

Speed is essential. Working out of 105 claims offices linked by teletype, Liberty claimsmen act fast to make certain an injured worker receives proper care and treatment. Medical specialists are rushed to the local hospital when severe injury requires it. A rehabilitation nurse begins her liaison among patient, doctor, patient's family and policyholder to plan a recovery program. Meanwhile, detailed claims investigation is started while the facts are fresh. Saving valuable minutes can save a life or a limb and also save compensation premium.

Fast, efficient claims medical services are only a part of Liberty's protection in depth. This advanced concept in business insurance also includes an occupational medical program and two rehabilitation centers to handle industrial accidents. A scientific research center tackles policyholder accident and loss problems, while 448 full-time safety engineers work to stop accidents before they happen.

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Ike's new budget . . .

- **Calls for new public works starts—a concession to the Democratic majority in Congress.**
- **But everywhere else, the word is "spend less." And construction takes a heavy cut.**
- **There will be less for schools, homebuilding, highways and pollution control as . . .**

The Spending Lid Stays Clamped

The Administration's ban on new starts for federal public works projects is over. President Eisenhower this week recommended groundbreaking on a long list of projects during fiscal 1961.

That, however, is the only crack in the money dam visible in the budget message the President sent to Congress Monday.

The recommended budget holds firmly to past positions on all forms of federal aid; it advocates a tight rein on money for homebuilding, highways, college housing, hospitals, pollution control, school construction and other areas of domestic spending involving construction funds.

One reason for the easier attitude on new starts is that Congress demands them. That was the one subject on which Congress overruled the President during the last session. The starts will help sweeten a budget that, for construction at least, would have been bitter medicine.

Construction outlays of the federal government will decline more than 4% in fiscal '61, to $7.47 billion from $7.7 billion in the current year, according to Budget Bureau estimates. In contrast, total federal spending will rise by $1.4 billion, from $78.4 billion to $79.8 billion.

Cuts in federal-aid highways and in military construction account for the decrease in construction spending. There will be $300 million less in each of those areas. Increases elsewhere fail to make up that decline.

The President wants Congress to give ground on its hard-won 1959 compromise on highway taxes and vote the full 1½-cent gasoline tax increase he proposed a year ago. And he wants Congress to clip authorizations for non-Interstate roads by $25 million a year during 1962 and 1963, down to $900 million from the present $925 million.

Congress will be more than happy to vote the necessary funds for new starts proposed in the budget message—and then some. Congress usually adds to any projects the President recommends as money bills go through the legislative mill.

President Eisenhower recommends funds to start 46 new projects for development of water and power resources—31, costing $306 million, to be built by the Corps of Engineers; six, costing $187 million, to be constructed directly by the Bureau of Reclamation (plus five to be financed by $11 million of bureau loans); three, worth $130 million, for construction by the Tennessee Valley Authority; and, on the lower Rio Grande River, an $11-million levee under jurisdiction of International Boundary and Water Commission.

For the Corps of Engineers, the President proposed 11 new navigation projects scattered from Alaska to Florida, 10 local flood protection projects (Hawaii to Rhode Island), six beach erosion control projects (five on the East Coast and one in Illinois), one multiple-purpose project with power and one addition to an existing hydropower plant.

Six of the Army Engineer projects exceed $10 million in value. These are the $64-million Green Peter Dam in Oregon, the $60-million Milford Reservoir in Kansas, the new $42-million Poe Lock in Michigan, the $32-million Maxwell Lock and Dam in Pennsylvania, the $30-million Baltimore Harbor improvement and the $13-million Fox Point Hurricane Barrier in Rhode Island.

Including minor amounts for the new starts, funds proposed for 1961 civil functions activities of the Corps of Engineers far exceed any prior years. Budget estimates call for appropriations of $936 million and expenditures of $910 million. The Corps will spend $742 million specifically to carry on construction of 166 projects previously started, 98 for flood control, 47 for navigation and 21 of multi-purpose character with hydro-power facilities.

Four of Reclamation's six new projects top $10 million in total cost. The largest is the $107-million Yellowtail Dam and Power Plant in Montana, followed by the $45-million Blue Mesa Dam of the Curecanti Project in Colorado, the $15-million Almena irrigation project.

Reclamation's 1961 budget promises to rank second only to 1950 in the history of the bureau. The appropriation request is $314 million and projected spending amounts to $300 million. In 1950, the bureau received appropriations of $373 million and spent $298 million.

(*Turn the page*)

Annual Report & Forecast

In the Jan. 28 issue, the editors of ENR will review construction's significant business events and technical advances of 1959, and forecast the trends that will shape the industry in '60. The survey's title: No Push-Button Boom.

. . . LESS for schools, highways, homebuilding, pollution control

Congress may not give the Corps of Engineers and the Bureau of Reclamation all that the President asks. This is a good spot for an election-minded, Democrat-controlled Congress to try and show it can do more at less cost. But that certainly will not mean any reduction in the number of new starts that have been planned.

TVA under the President's program would start an $80-million unit at the Paradise Steam Power Plant, the $34-million Melton Hill multiple-purpose project and a new $16-million lock at Wheeler Dam. The entire cost at Paradise and all power costs of the Melton Hill project are to be financed by TVA out of power proceeds and sale of revenue bonds.

Congress last year gave TVA authority to issue up to $750 million of these bonds. Of the $179 million estimated for direct construction expenditure by TVA in 1961, only $13 million will come out of government appropriations.

Mr. Eisenhower holds to conservative standards for government housing programs. But his message does recommend $150 million of Treasury funds for purchase of FHA mortgages on homes to house displaced families or renovate urban areas.

Likewise he requests that his housing agency be given $20 million of government money for public works construction loans to small communities that can't get private capital (see p. 77).

In addition he proposes extension of FHA insurance for home improvement loans, an authority that is due to expire October 20.

But Mr. Eisenhower doesn't even mention the proposal for purchase with federal funds of government-backed mortgages on new low-cost homes. And he sees no need this year for any additional authorizations for FHA mortgage urban renewal grants or public housing.

The President opposes extension of the Veterans' Administration direct loan program beyond the July 20 terminal date. He asks, too, for removal of the VA 5¼% interest ceiling to let GI mortgages compete for financing in today's market.

Mr. Eisenhower wants no more federal funds for low-interest loans to colleges to build student and faculty housing. He would transfer the operation to a broader but tighter college loan-guaranty program, eased by rationing of federal grants to eligible projects proposed for the Department of Health, Education and Welfare.

General Services Administration is down for a $160-million appropriation in the 1961 budget to construct 16 federal office buildings that will be up for bids that year.

The Post Office Department that year expects to let commercial leasing contracts calling for construction of some 1,400 buildings costing $67 million.

The National Aeronautics and Space Administration will start facilities at a half dozen sites out of a $70-million construction appropriation.

The President offers no compromise to Congress on his limited-aid plan for school construction. His program would pay half the debt service on $3 billion of bonds issued in the next five years by needy districts. More liberal congressional bills are currently stalemated.

The President proposed to reduce school aid to federally affected districts, but this idea has run into a congressional dead end before.

The President also asks for a reduction in Hill-Burton aid to local hospitals. This proposal will also meet opposition in Congress.

Air Force construction bears the brunt of the $300-million cut in military public works. The Air Force segment is due to drop more than $240 million below its current year estimate, which tops $1 billion.

Budgeted for Construction

Fiscal year expenditures (in millions)

CIVIL WORKS	1960 Estimate	1961 Estimate
Federal Projects:		
Capitol Buildings	$28.9	$54.2
Federal Aviation Agency	139.1	162.2
National Aeronautics and Space Administration	45.0	75.0
Tennessee Valley Authority	135.4	178.7
Veterans Administration	60.0	62.8
General Services Administration	148.1	170.6
Department of Agriculture	86.4	82.0
Corps of Engineers, Army—civil	693.8	742.4
Department of Health, Education and Welfare	35.1	28.7
Department of the Interior:		
Bureau of Reclamation	180.7	233.3
Bonneville Power Administration	22.4	20.4
Bureau of Indian Affairs	32.9	31.0
National Park Service	51.1	51.1
Other	23.2	22.5
Post Office Department	71.8	80.0
Department of State	23.0	15.9
Other	98.2	119.7
Total, Projects Construction	**$1,875.0**	**$2,130.7**
Grants to State and Local Governments:		
Federal Aviation Agency	$72.4	$81.4
Soil Conservation Service	31.6	36.0
Office of Education	62.0	61.1
Public Health Service	120.7	129.7
Other	41.6	5.2
Total, grants	**$328.3**	**$313.4**
Loans to State and Local Governments, Net:		
Housing and Home Finance Agency	$148.1	$122.0
Bureau of Reclamation	10.6	19.8
District of Columbia	6.7	13.2
Other	4.9	9.5
Total, Loans	**$170.2**	**$164.4**
Other Buildings	$12.4	$7.7
Grants, Bureau of Public Roads	2,998.2	2,696.5
REA Co-ops, Hospitals, College Housing, etc.	502.6	528.6
Total Civil Works Construction	**$5,886.8**	**$5,841.4**
DEFENSE		
Military Construction	$1,662.0	$1,354.1
Atomic Energy	248.9	277.7
Total Defense Construction	**$1,910.9**	**$1,631.8**
Total Federal Construction	**$7,797.7**	**$7,473.2**

Highway Research and the City

• "By 1975, the urban population of the United States is expected to be about 143 million, nearly 75% more than that of 1950."

• "At that time, we must be able to handle the movement of unprecedented numbers of people and goods into, around, and within our urban areas, if our cities are to survive as places where civilized man can lead a civilized life."

These and similar analyses of problems facing the essentially urbanized America of 15 years hence formed the challenging background for the 39th annual meeting of the Highway Research Board last week. More than 2,500 scientists, engineers and administrators exchanged information on latest developments in economics, planning, traffic, design, materials, construction, soils, maintenance and urban research.

Topics ranged from details of laboratory and field testing procedures to broad definitions of needed research in human behavior and the impact of highway development on the nation's economy.

Coleman Woodbury, director of Urban Research at the University of Wisconsin, sounded the keynote of the meeting. After a comprehensive analysis, Mr. Woodbury defined this framework for future urban studies, with emphasis on transportation:

• Theory of urban development. Studies that yield information not only about relationships existing at any one time among various groups or districts in an urban area, but also about processes of change.

• Standards, of which zoning and subdivision control are only the major examples.

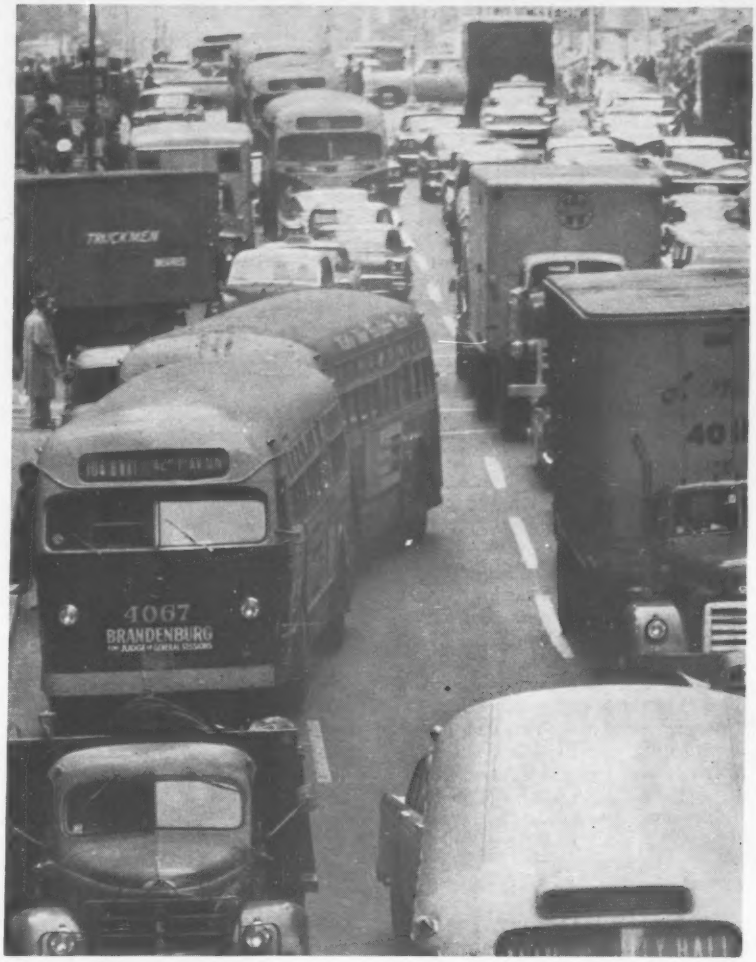
• Basic policy matters, particularly those pertaining to planning, finance, and public education and participation in public affairs.

• Policy matters relative to urban circulation, i.e., the movement of goods and people in an urban area.

Facts are known and techniques are available to engineers, planners, economists, sociologists, and many others within each of the major areas of study. Yet expanded research must be carried forward in a systematic fashion to provide the tools needed to arrive at rational solutions to existing and future problems.

Harmer Davis of the University of California, retiring chairman of the board, summed up the challenge faced by highway transportation experts in these words:

"We seem to be entering a period, if indeed we have not already entered it, in which it is becoming increasingly important to regard larger and larger segments of our highway transportation complex as coordinated systems in the technical sense. We are, and will be over the next two or three decades, building or rebuilding the highway facilities on an unprecedented scale; we are providing vehicles in unparalleled numbers and capacity for movement; we are struggling with operating problems of a magnitude not hitherto known.



The provision and operation of this transportation scheme is enormously costly and it is having a profound effect on our way of living.

"Further, and of no less importance, the investment now being made in this extensive plant will have significant effects on our economy for a long time to come. We would thus appear to be duty bound to continue to strain to the limit in an attempt to forecast the functioning of this tremendous transportation complex, in spite of its great intricacy. This means planning or design on a level of refinement unknown in earlier decades. And this is placing a premium on research and analysis, for there is no time for a long period of trial and error."

Another view was expressed by anthropologist Lawrence Krader of American University, who said that America must somehow secure a vision of its future to guide metropolitan area development toward well defined goals. Also necessary is a "sense of consequences" of failure in this respect.

"If we are to enter an era of comprehensive planning, we must try to establish what we are planning for," said Mr. Krader. Two principal elements are involved, according to the social scientist—the physical, technological design of the community, and its social relationships and patterns. Progress is being made in the proper blending of these two elements, since planners and designers are showing increasing

(*Turn the page*)

. . . New techniques, materials for highway designers

concern for the social needs and uses of highways.

One speaker—Lee J. Melton, Jr., of Louisiana State University—offered a somewhat drastic solution. "Basis of the so-called transportation problem," he asserted, is the uncoordinated and excessively competitive operations of transport agencies subject to diversified regulatory acts, different commissions, and unrelated promotional activities."

Mr. Melton suggested that the ultimate solution may lie in a change in the economic structure of firms offering transport service, which would eliminate interagency competition and provide a basis for uniformity of such regulations as might be required. These transportation companies would utilize all or several forms of transport.

Researchers from Ohio and Connecticut showed substantial reductions in highway accidents and improvement in traffic flow by a very simple technique—the marking of the outer edges of pavements to delineate the traveled way from the shoulder. Beginning in 1957, the Ohio Department of Highways began marking pavement edges on certain sections of two-lane roads. Other similar sections were left unmarked. Before-and-after studies showed a decrease of 19% in total accidents on the edge-marked sections, compared with similar unmarked stretches. The Connecticut investigation showed that the marking of pavement edges contributed to a major reduction in accidents involving pedestrians. Average daytime speed increased an average of 4.1 miles per hour, and average night time speed by 6.5 mph.

Engineering acceptance of electronic distance measuring methods for highway surveying was indicated by reports from four state highway departments. Engineers reported cost and time savings realized through use of the Tellurometer System over hundreds of miles of highway location survey lines. Principal use of the system was in establishment of horizontal control for ground and aerial surveys; results were reported to be well within limits of second-order accuracy.

H. A. McBride, field operations engineer for the Mississippi State Highway Department, reported that "it is our belief that the over-all cost of using the Tellurometer is less than 50% that of conventional methods, and about 100% more coverage can be obtained in the same time."

Contractors who must control dust during construction will find value in California investigations in which the relative effectiveness and cost of water, diluted asphalt emulsion, a lignin product and an asphaltic resin product were evaluated. Water proved to be the most expensive and generally the least effective of these materials.

California and Washington have installed skewed transverse contraction joints in plain concrete pavements as a normal construction procedure. The joints are skewed just enough so that wheels move across each joint one at a time, and were reported to show superior performance to contraction joints placed at right angles to the pavement centerline.

Featured among the newer materials for highway and bridge construction and maintenance were epoxy resins and polymers, T-1 steel, phosphoric acid (for soil stabilization) and latex modified cement mortar. Epoxy resins are in use or proposed for use in traffic paint, for waterproofing bridge decks, for bridge and pavement repairs, for skid-proofing pavements and gratings, for bituminous paving mixtures, and as tunnel lining materials.

An over-all discussion of "electronic highways" included a demonstration of an "Electro Lane," which is somewhat analogous to an aircraft "beam." It is a low frequency electro-magnetic device said to be relatively simple and easy to install. On a four-lane divided highway, one longitudinal wire could be installed beside the pavement on the right side and another on the left. The wires in effect create electrical fences. A car could be equipped with ferrite core pickup coils hanging from either side of the front bumper.

When a car veered to the right or left, the coils would pick up electrical impulses from the wire. These could then activate a buzzer on the car's instrument panel.

The device would aid traffic safety by alerting an inattentive driver, assisting in keeping a vehicle on the pavement in darkness, fog, or snow, and preventing between-car accidents.

The Highway Research Board conferred its Roy W. Crum Distinguished Service Awards on two highway engineers—Prof. M. G. Spangler of Iowa State University and G. P. St. Clair of the Bureau of Public Roads. Professor Spangler was named for his research achievements in soils and structures; Mr. St. Clair for work on highway financing and taxation.

Honored for the best technical paper delivered at last year's meeting of the Board were Charles J. Keese, Charles Pinnell, and William R. McCasland, all of the Texas Transportation Institute, for their research report on freeway operations.

The Board announced the election of Pyke Johnson as chairman for 1960. Now consultant to the Automotive Safety Foundation, Mr. Johnson is a former president of that organization.

This old Los Angeles school was mater

Fighting Fi

There were 70 fires in a single Los Angeles school last year—all set by the fire department.

The apparent pyromania was part of an intensive investigation of how to save lives in case of fires in old schools, particularly multistory, open stairway buildings.

A complete sprinkler system, which fights the fire and slows the spread of dangerous smoke and gases, is the best defense, the firefighters report. But the key to safety is evacuating the building quickly, says California State Fire Marshal Joe R. Yockers, who recommends an outside exit for every classroom.

The fires were set in an old three-story school structure, which was marked for demolition. The building was somewhat similar to Our Lady of Angels School in Chicago, where 95 persons perished in a fire Dec. 1, 1958. Many of the tests duplicated conditions encountered in the Chicago tragedy. Thus most of the fires were set at the base of stairwells, which is where the Chicago fire started.

Although enclosed stairways minimize the spread of fire and smoke, many school administrators object to closing stairway doors because they interfere with the movement of students.

The tests therefore concentrated on substitute ways of preventing fire and smoke spread: Curtain boards extending from the ceiling as partial partitions

the wrecking ball . . .

When fire department decided it was a natural site for . . .

Fire With Fire: A Safety Experiment

at stairway openings and in corridors; roof vents over stairways; and various kinds and combinations of automatic sprinklers. The firemen also tabulated data on automatic fire and smoke equipment, fusible links and automatic door closures.

All fires were set in piles of seasoned wood pallets and allowed to blaze for 24 minutes.

The building had brick exterior bearing walls and reinforced concrete columns, girders, corridors and stairs. Corridor and stairway walls were either brick or plastered hollow tile. Floor framing was wood; classroom partitions were metal lath and plaster on wood joists.

The firemen found that smoke is the most critical hazard in the early stages of a fire. So quickly did smoke become untenable that occupants could not withstand it during the time necessary to evacuate the building.

A complete system of automatic sprinklers, however, reduced the build-up of smoke and irritating gases in almost every case. But where the source of the fire was shielded from the sprinklers, the spread of smoke was unchecked, although the fire itself was contained.

Roof vents and curtain boards proved unsatisfactory in slowing the spread of smoke.

Automatic heat detection devices warned of the fire too late to escape dangerous smoke conditions.

Walls are all that are left after 70 fires.

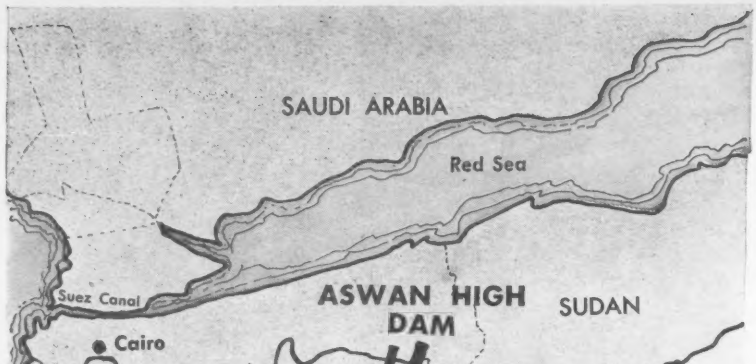
Automatic smoke detectors reacted more quickly—but not quickly enough to allow complete evacuation before the smoke became dangerous.

Complete results of the tests are available in a 260-page book titled "Operation School Burning," which can be obtained from the National Fire Protection Association, 69 Batterymarch St., Boston 10, Mass.

The test program was developed with financial assistance from the Educational Facilities Laboratories, Inc., a separate corporation established by the Ford Foundation to help schools and colleges with their physical problems. Other sponsors of the program were the Los Angeles Fire Department, the Los Angeles Board of Education and the California State Fire Marshal.

As an immediate result of the tests, at least one California school district faces legal action to force closing of three of its schools, because of failure to provide sprinklers. (They are in Berkeley, where the school district lacks construction funds due to failure of two bond issues last year).

Further research also was suggested on smoke detection and prevention.



500 miles up the Nile from Cairo . . .

Egypt, U.S.S.R. Start Aswan Dam

An underwater soil placement technique used only on small jobs in this country will get a big-scale tryout at Egypt's Aswan Dam.

Russian engineers expect to place fine material for the upstream cofferdam by dumping the material and letting the current drift it into place. Before this operation, the coarse material—granite rubble—will be placed by dumping from trucks driven out on pontoon bridges over the cofferdam location.

First-stage construction began on the huge Nile River development two weeks ago. The start is expected to intensify competition among contenders for second-stage contracts, which will include construction of the main dam.

Actually, the upstream cofferdam will become a permanent part of the main dam eventually. This makes some American dam experts doubtful about the wisdom of the Soviet plan. However, the Russians are reported to have allayed Egyptian fears by demonstrating the method at a Soviet dam under construction on the Dnieper.

Major difficulties in constructing the cofferdam are the depth and flow rate of the water. The work has to be done in water ranging from 65 ft to some 130 ft deep. And during the flood season, up to 350,000 cfs of water may flow over the 1,650-ft.-long cofferdam.

Since the height of the cofferdam will be built up in stages while the entire work is still submerged, the structure has to be able to resist erosion at every stage.

Another difficulty anticipated by the consulting board, which includes three Americans, is layers of open-work gravel near the cofferdam abutments. The very high permeability of these strata creates a danger of failure by piping.

Aswan High Dam will be a 361-ft-high rockfill structure with a volume of nearly 55 million cu yd. It will have a clay core, upstream impervious blanket and grout cutoff. The structure will be 3.1 miles long. It will impound 105 million acre-ft of water (ENR Feb. 9, 1956, p. 44).

The original plans called for seven diversion tunnels, but plans now are to divert the river through a single open channel. This change was made by Soviet engineers last year (ENR July 9, 1959, p. 23).

The Soviets gained a voice in the dam design when Egyptian Premier Nasser accepted a Russian offer of $100 million in aid for first-stage construction. The U. S. canceled an aid offer in 1956.

Most of the Russian aid will be in construction equipment. Large shipments of heavy equipment up the Nile from Alexandria have been reported.

Second of the two main changes made by the Russians in the existing plans for Aswan was substitution of granite for dune sand in an 83-ft-deep foundation layer.

The Soviet diversion scheme does not eliminate tunnels completely. At about mid-length of the open canal, the water flows underground through six tunnels for several hundred feet. The six short tunnels will be equipped with regulating gates and will serve the same ultimate purposes—flood release and irrigation control—as planned originally for the long tunnels.

Rock Did Shift

Malpasset report delayed as engineers check fault

The team of French engineers investigating the collapse of Malpasset Dam (ENR Dec. 10, 1959, p. 24) may not have its report ready in time to meet the original January 31 deadline.

Unconfirmed reports say they need more time to make further studies of left-bank rock strata.

It is now generally conceded among French engineers that Malpasset's collapse was caused by a shift in the rock under the left-bank foundations. An engineer attached to the Ministry of Agriculture recently told the Municipal Council of a small town in western France, near the site of two proposed dams, that the Malpasset tragedy was the direct consequence of water infiltration into a fault that could not have been detected by geologists with test borings.

This statement evoked a response from a geologist of the investigating team, who told reporters that although it was certain that the fault (visible on the left bank after the catastrophe) was at least partly responsible for it, in his opinion the fault could have been discovered by test borings made during excavation of the foundations. Whether or not the borings were made apparently shapes up as an important point in the investigation.

In any event the possibility that water infiltration into a rock fault was the origin of the abutment failure is related to another unconfirmed report which described the fault as a clay seam about 1¼ in. thick. Such clay when wet could act as a lubricant as well as constituting a weak plane in the rock. Water pressure from the reservoir could then push a rather large section of the rock abutment into the canyon below the dam. Or even before this, as the abutment yielded under pressure, the arch thrust would be concentrated on whatever sound rock was left at the top and the bottom. Such support could have proved inadequate resulting in the failure of the arch itself.

Steinman Will Make Study Of Golden Gate Capacities

David B. Steinman, New York City consulting engineer, will conduct a four-month study to determine feasibility of running high-speed rapid transit vehicles across Golden Gate Bridge.

A rapid transit route between San Francisco and Marin County is a key link in the 125-mile, five-county rapid transit system proposed for the Bay Area.

Minority Opinion

Ackerman says California water plan is unfeasible

Plans for an aqueduct system on California's huge Feather River project are financially unfeasible, says a minority report presented to Harvey Banks, director of the California Department of Water Resources.

The report was prepared by Adolph J. Ackerman, the one dissenting member of a board of consulting engineers that recently approved the project's engineering feasibility (ENR Dec. 24, 1959, p. 20). Mr. Ackerman's thesis, however, is that engineering feasibility cannot be divorced from financial feasibility. He did not sign the majority report.

His dissent is another blow at the prospects of a $1.75-billion bond issue to finance the aqueduct project. Voter approval next fall is now very much in doubt.

Here are the main points of Mr. Ackerman's report:

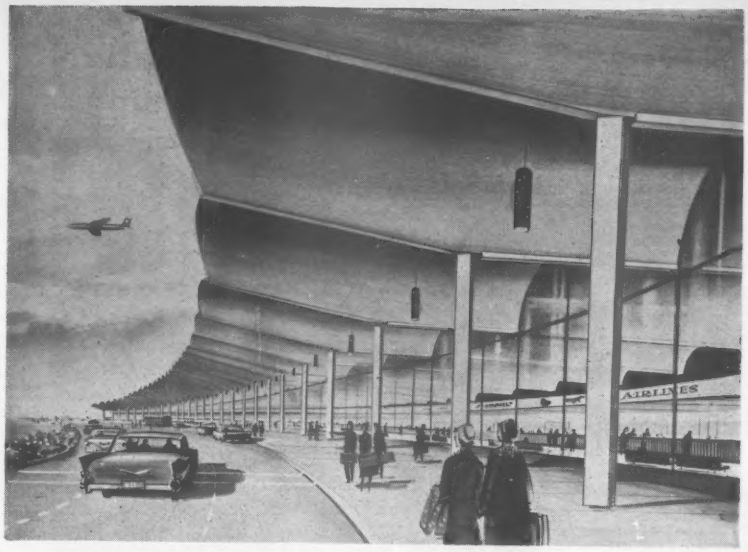
• **The long-range financial planning involved is uncertain.** The payment period is projected over more than a hundred years. Forecasts of growth in the state's economy and in water demand over that period are based on the assumption that there will be no major economic disturbance. "Such an assumption is outside the range of competent judgment and wholly unsupportable," Mr. Ackerman said.

• **Cost estimates are inadequate.** "Little recognition has been given to the probability of cost increases during the coming decades." Total public expenditures for the water program are likely to be several times bigger than $1.75 billion.

• **A $1.75-billion bond issue may hurt the state's credit.** California's bonded indebtedness has risen from $100 million in 1945 to $1.7 billion in 1959. Should bonded indebtedness increase at the present rate, the debt total would be $15 billion by 1990, with $6 billion for water alone. Thus adoption of the bond issue would contribute to damaging the state's credit position for many years to come.

Mr. Ackerman did not offer a concrete solution to California's problem, but he implied that the aqueduct project could be undertaken in small increments. He said, "Substantial opportunities exist for financing a major portion of the project by means of revenue bonds." (The $1.75-billion bond issue would be a general obligation bond.)

Opposition to the bond issue that existed before Mr. Ackerman registered his objections has been based on water rights and acreage limitation as well as economic feasibility.



'H-P' to Roof Air Terminal

Precast hyperbolic-paraboloid sections, 1,000 sq ft in area, will roof the $4.8-million terminal building of Metropolitan Oakland International Airport. The two-story terminal building, with its 11-story control tower, is part of a $17.5-million expansion program that includes a ticketing building and a 10,000-ft jet airliner runway.

The 500-ft-long ticketing building features a conoidal canopy cantilevered out over the sidewalk and parking lane.

Present schedule calls for construction to start in mid-1960. The work will be completed in late 1961.

The project is located on a 600-acre site that was reclaimed by pumping 14 million cu yd of sand from San Francisco Bay.

Architect is Warnecke & Warnecke of Oakland; structural engineer is Isadore Thompson of San Francisco.

Around the World . . .

• **Biggest hangars**—France claims the record for the world's largest hangar with the new one at Paris' Orly Airport. It measures 990 x 171 ft. The hangar is of cantilever steel construction similar to two earlier ones, (ENR Oct. 27, 1955 p. 34).

• **Research center**—A $5-million gift will help finance construction of a medical research center for Columbia University. Estimated cost is over $10 million. Tentative plans call for construction to start by the end of 1960. William Black, president of Chock Full O' Nuts Corp., is the donor.

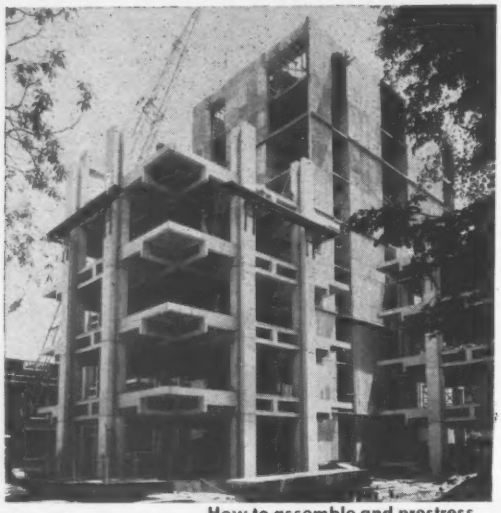
• **Skids get the skids**—A braking system that is claimed to eliminate automobile skidding has been announced by Motor Vehicle Research, Inc., Lee, N. H. The device is said to sense road conditions and control total wheel lock-up during braking, thus preventing skids.

• **End of the road**—The final gap in Germany's Hamburg-Frankfurt Autobahn, a 57-mile stretch near Hanover, will be closed in 1962, two years ahead of schedule. This means that the north-south Hamburg-to-Frankfurt-to-Basel route will be finished 35 years after it was begun.

• **Michigan office towers**—Two 12-story office buildings will expand the services of the Northland Shopping Center located in the Detroit metropolitan area. Designer-builder H. L. Vokes Co. of Cleveland will start construction on the $8-million project in mid-1960.

• **Bascule bargain**—Hawaiian Dredging & Construction Co.'s low bid of $1,269,000 for the superstructure of a double-leaf bascule bridge over the second entrance to the Honolulu harbor was $256,000 under Corps of Engineers estimates. The bridge, with approaches, will be 690 ft long.

STRESSTEEL was the solution to this Engineering Problem



Medical Research Center, University of Pennsylvania, Philadelphia.

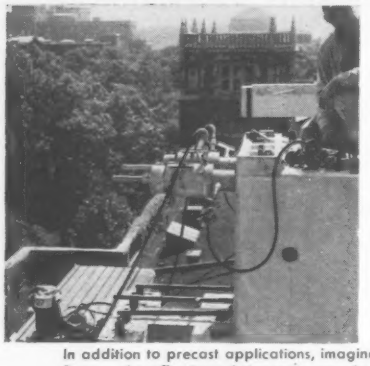
Louis I. Kahn, Architect: Keast & Hood and Dr. August E. Komendant, Structural Engineers.

Joseph A. Farrell, Inc., General Contractor.

Atlantic Prestressed Concrete Co., concrete units.

THE PROBLEM: How to assemble and prestress in place, 8 precast concrete segments in each floor system of a 7 story clear-span Vierendeel frame building, with maximum efficiency and minimum cost.

THE SOLUTION: Post tension with STRESSTEEL, taking advantage of the inherent rigidity of STRESSTEEL Bars and the simplicity of STRESSTEEL Wedge Anchors.



The building consists of 3 wings, each 47 feet square, made up entirely of precast members surrounding a central unit of cast-in-place concrete. The framing in each floor required post-tensioning 2 beams made up of precost segments. STRESSTEEL Bars, 2 @ 1⅛" ∅ and 3 @ 1¼" ∅ furnished a force of 575,000 lbs. per beam.

These bars were threaded through holes preformed in the interlocking precast segments by workmen operating from a scaffold suspended from the crane. STRESSTEEL Bars were simply and quickly tensioned with electrically operated hydraulic jacks and then pressure grouted.

In addition to precast applications, imaginative engineers are using STRESSTEEL Bars as the effective solution to many other problems. These high strength alloy steel bars are available in sizes up to 1¼" ∅ with recommended working stress up to 90,000 psi. Equipped with wedge or threaded anchors, STRESSTEEL Bars have been used for sheet piling ties in cofferdams, embedded ties for tainter gate trunnions, arch ties, buttress ties and many other unusual and special applications.

You will achieve superior results at substantial savings with STRESSTEEL because it is . . .

- High strength alloy steel
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Are you working on a special anchorage, tie rod or foundation problem? STRESSTEEL'S high strength reinforcement, combined with the advantages of post-tensioned prestressing, may well be the optimum solution. Ask us.

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Glass-Enclosed Building Offers Column-Free Space

Crown Zellerbach Corp. last week officially dedicated its new 20-story headquarters building in downtown San Francisco (ENR May 29, 1959, p. 37).

Outstanding feature is the column-free interior of the office wing, provided by a fireproof structural steel frame. Girders span 63 ft across the building between exterior columns.

Nearly three acres of glass enclose the 255,000 sq ft of office space. Wall facing for the utility tower is Italian mosaic tile.

Interstate Highway Funds Recommended for Hawaii

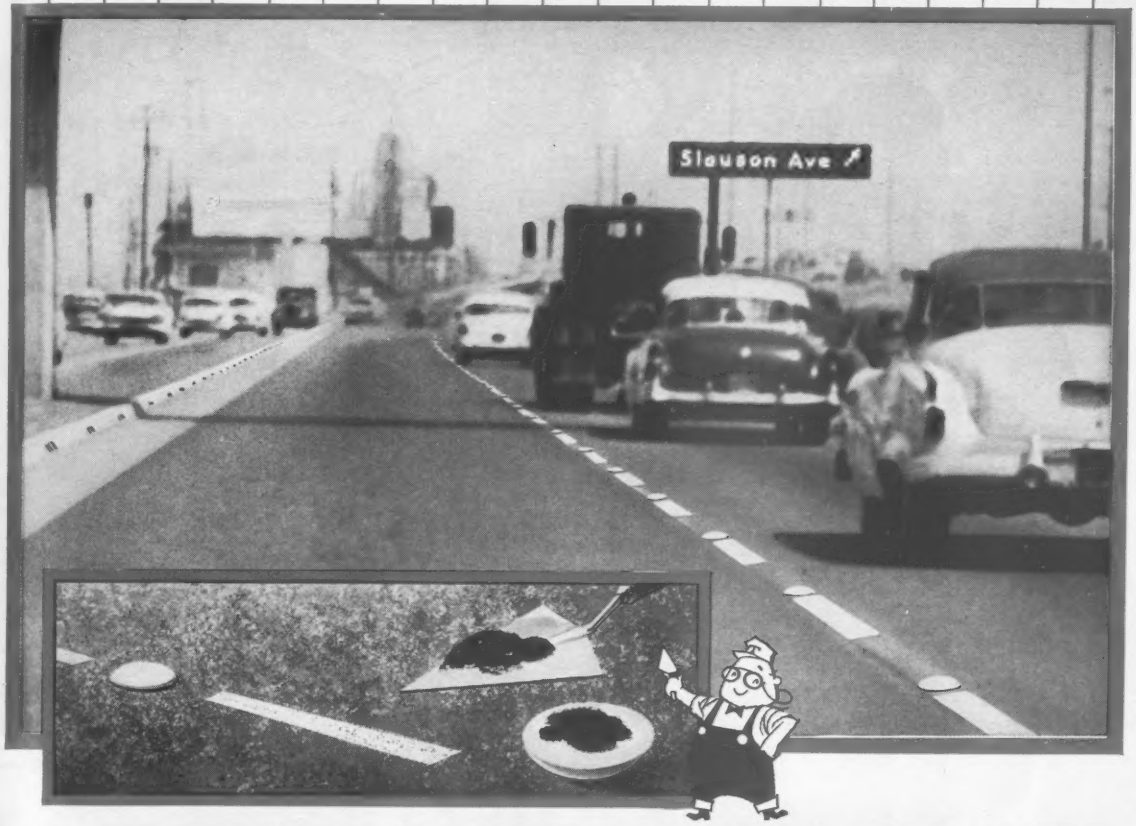
Construction of 50 miles of highway in Hawaii under the Interstate and Defense Highway System was recommended to Congress last week by Secretary of Commerce Frederick H. Mueller.

If Congress approves the proposal, Hawaii will be eligible for federal assistance worth 90% of the cost of the 50 miles of highway.

No similar recommendation was made for Alaska, the other new state. The Secretary's report said:

"Neither the present conditions nor anticipated further developments for the next 15 or 20 years warrant the designation of any Interstate mileage in Alaska."

REPORTS *on concrete bonding with THIOKOL LP/Epoxy compounds*



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The California State Highway Department discovered it . . . a combination of THIOKOL polysulfide liquid polymer and epoxy resin produces a concrete-to-concrete bond *that's stronger than concrete itself.*

In an experimental application, traffic buttons were fastened to pavement using the adhesive alone—substituting for the conventional, time-consuming and troublesome method of steel doweling. The experiment took place at a highway point averaging 30,000 vehicles a day. Although the installation was made six years ago, the buttons are still completely intact and in service. The test was repeated in areas where traffic is still greater. Of the thousands upon thousands upon thousands of buttons installed this quick, easy way, failures of less than 1/10th per cent have been noted.

The same THIOKOL LP/Epoxy concrete adhesive has since successfully met the challenges of time, temperature and wear on other highway applications—in repairing spalled and scaled areas, broken slabs and cracks, in securing cement overlays, in skidproofing and sealing. To get the full story, mail the coupon.

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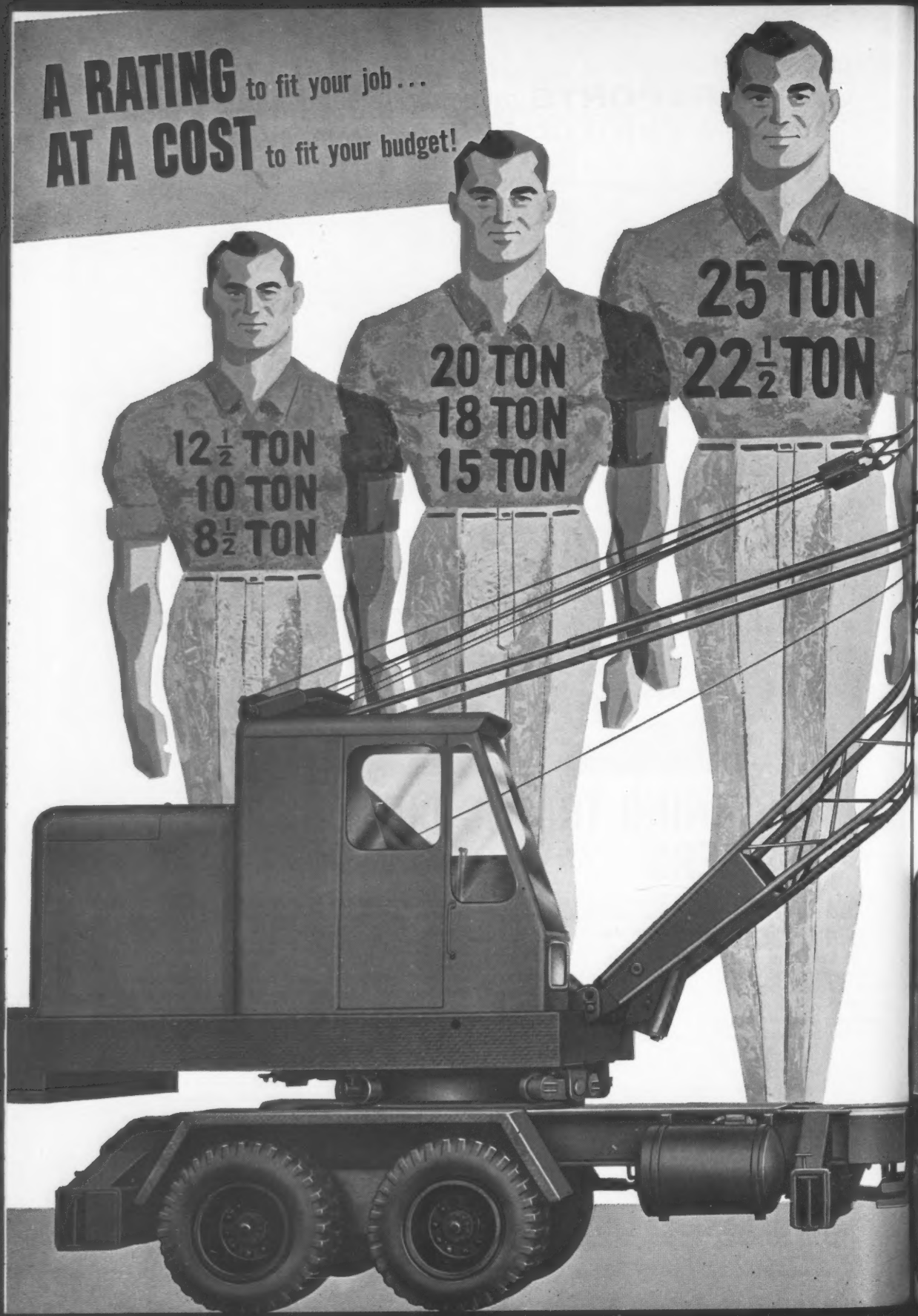
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AT A COST to fit your budget!
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18 TON
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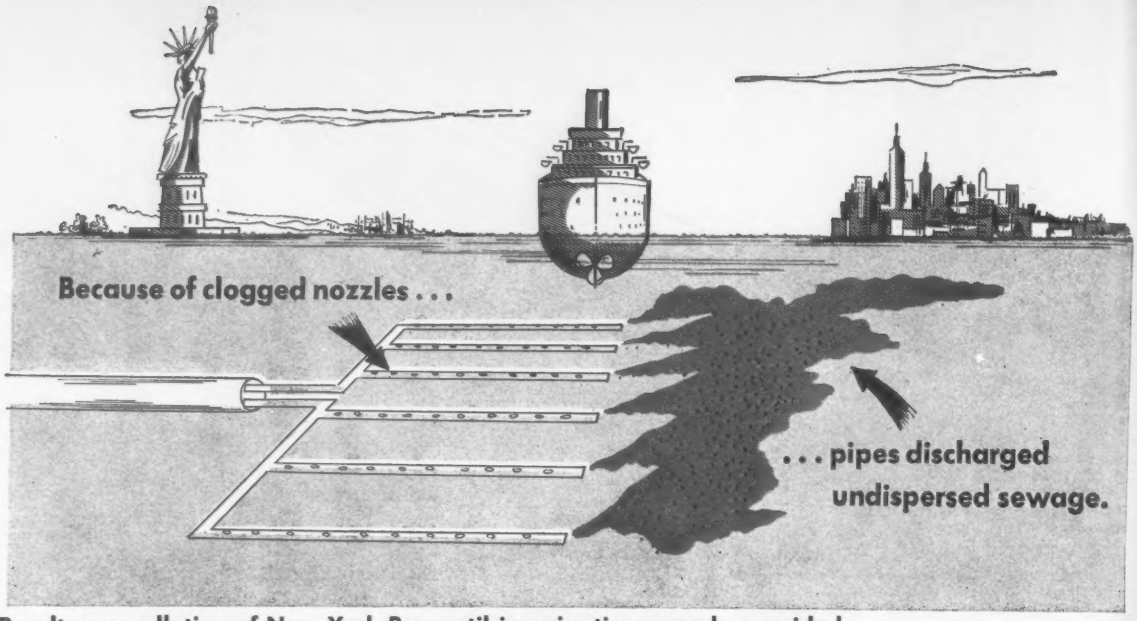


Result was pollution of New York Bay until imaginative remedy provided . . .

New Life for Aging Dispersal Field

Just off Robins Reef Light House in New York's Upper Bay, a 40-year-old sewage dispersal structure is now working like new in 10 fathoms of water after a half-million-dollar repair job. Its outlet nozzles found clogged with grease, it has been given new ports by drilling out the old cast-iron nozzles with a specially designed, remote-controlled core drill.

Groping in the darkness of the turbid bay bottom, a diver (who incidentally worked on installation of the dispersal structure in 1918) reported on the clogged condition of the nozzles he could find among the 150 installed. He also reported sewage flowing undispersed from the open ends of the dispersal field's six long fingers.

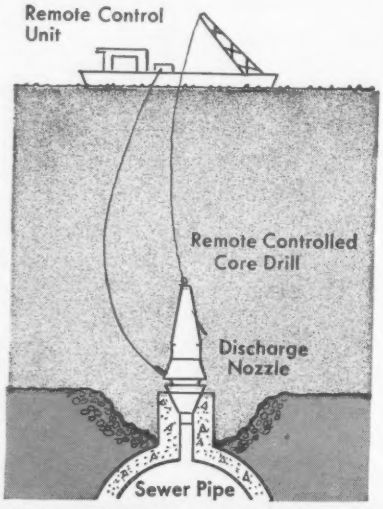
All's well now. A half-million-dollar repair job is done, and the million-dollar (1918 prices) dispersal field, which would cost over $5 million today, is functioning again.

This dispersal field disposes of effluent from New Jersey's Passaic Valley sewage treatment plant at a point close to the New York state line—in interstate waters and purposely as close as possible to the churning action of ship screws in the harbor's navigation lanes.

The Passaic Valley Sewerage Commissioners, back in 1918, put their treatment plant on Newark Bay after U. S. Supreme Court action which stipulated its tunnel outfall could extend five miles to bring its discharge to New York Bay as long as the flow to be dispersed there was unobjectionable to eye or nose.

But in the late '30's the New Jersey plant's effluent began boiling up in the bay, indicating that it was coming undispersed from 24-in. open ends of the finger pipes, rather than through their nozzles. Sewage solids and offensive odors were prevalent—particularly at low tide.

By **Donald M. Ditmars,** *Partner, Bogert & Childs, Consulting Engineers, New York City.*



NEW OPENING was made in each nozzle by surface-controlled core drill.

Purpose of the dispersion, of course, was to divide the sewage physically, dilute it, spread it out for more effective natural purification. This is still the purpose.

The dispersal field covers 3½ acres 40 to 60 ft under water. It is a structure in two parts. Each part is a 96-in. pipe from the terminal chamber at the end of the sewage tunnel; each 96-in. line tapers down to 72 in. and has three 60-in. fingers running from it at about 100-ft intervals. These finger lines taper from 60 to 32 in. and extend 50 to 200 ft. Each finger ends in a ⅛ upward bend with a bushed-down 24-in. open outlet. On each of the two headers and on all six fingers there were mounted at 10-ft centers cast-iron nozzles with helical waterways—150 of them in all.

The 2-in. spiral waterways of the 800-lb nozzles were supposed to induce most efficient dispersal of flow from the pipes. Instead they clogged.

Spearin, Preston and Burrows was the contractor signed to examine the nozzles; H. D. Grove was their diver who had been on the bay bottom here before, when the pipes were placed.

The fast currents at the dispersal field made inspection difficult. The diver had at best 100 minutes of working time in slack water. And this couldn't be counted on; currents were affected by the Hudson River's flow and by winds as well as by tides.

(*Turn the page*)

#6

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HY-Q SLUICE GATES WITH FLUSH-BOTTOM CLOSURE
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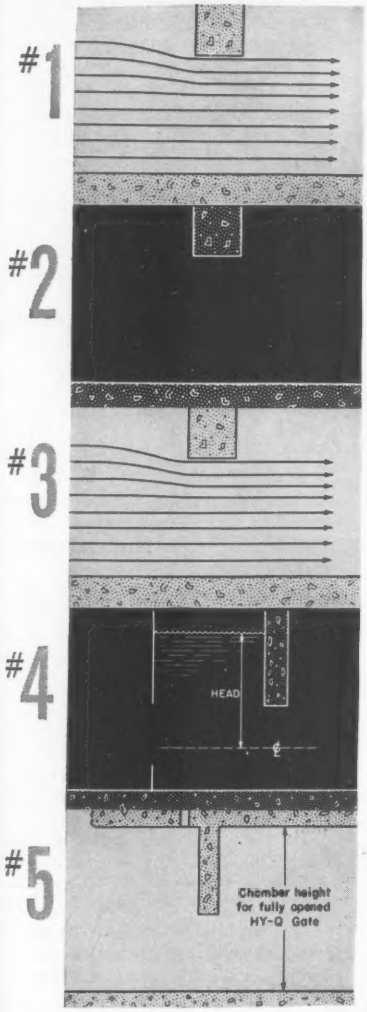
HY-Q® Sluice Gates Mean Construction Economies



Because of the improved flow characteristics of the Rodney Hunt HY-Q sluice gate, a given volume of flow can be handled with a smaller gate size, narrower channel and lower channel walls than are required for a conventional gate. Thus there are often substantial economies effected in concrete construction. This improved flow is the direct result of the 5 other design advantages of the Rodney Hunt HY-Q sluice gate:

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#2 HY-Q Sluice Gates Assure Complete Drainage

#3 HY-Q Sluice Gates Eliminate Interference with Flow

#4 HY-Q Sluice Gates Assure Maximum Hydraulic Gradient

#5 HY-Q Sluice Gates Permit Lowest Possible Invert

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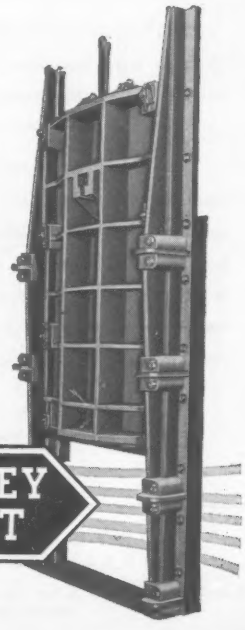

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. . . Dispersal field

The inspection was entirely by feel. Insufficient light penetrated the polluted depths to make anything visible, and use of electric lights was considered to be risky by the diver.

The diver discovered only six of the 150 nozzles discharging properly; all but 14 were covered with 3 to 24 in. of mud. Grease was clogging the nozzles. Practically all the effluent was coming out the ports at ends of the finger lines.

It took a lot of time and study to settle on a method for reopening the nozzles. Brushing, burning, blasting, jetting and chemicals were considered. All were discarded. It was finally decided that a core drill might be found to cut the cast-iron spiral nozzle from the ports in the pipe. A remote-control drill would be the ideal.

The consulting engineers, Bogert and Childs, of New York City, worked with manufacturers on a drill that could be centered and clamped onto each nozzle by the diver. Norton Co. of Worcester, Mass., and Acker Drill Co. of Scranton, Pa., came up with the remote-controlled tool for the task, driven by a 25-hp air motor. It was made to recover the 12-in. core it drilled.

First the drill was tested; three nozzles were drilled out. Carbide bits worked well in the rig, and a modified core lifter similar to those used in diamond drilling proved adequate for retrieving the cores.

Once the drill was placed by the diver, its operation was controlled completely from a barge at the surface. The only evidence of its operation was the throbbing of the air compressor driving it, but gages and indicators for all pressures and motions of the drill kept the operator informed of its work.

Cutting time came to be a fast 33 minutes per nozzle. The nozzles were cut out at a rate of two per day.

To complete the repair job, each newly drilled 12-in. port was fitted with a dispersal "umbrella," a casting heavy enough to stay put on the finger pipes despite upward flow of the sewage plant effluent. Clearances under the umbrellas are a minimum 8 in.; they can't collect grease.

Finally, concrete plugs were put in the end-ports of the finger pipes.

The whole job took less than 300 calendar days.

Once again, the dispersal field (which was inoperative, but not shut down while the repair job went on) is now working as it was meant to work. The freely flowing dispersal field should result in sanitary conditions equal to disposal without dispersion of a better treated effluent.

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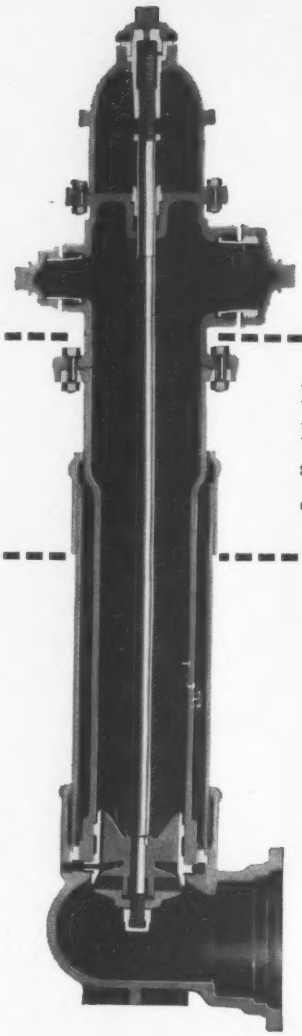

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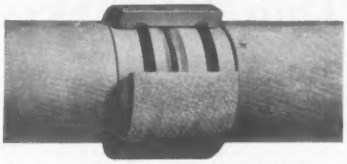

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Two Bridge Designs Contrast bu

Two pairs of aluminum alloy bridges, probably the first of their kinds in the U.S., are going up on Long Island, because the New York State Department of Public Works is seeking cheaper bridge construction and reduced maintenance costs.

"What we're looking for is competition," says Carroll F. Blanchard, the department's deputy chief engineer for bridges, grade separations and structures.

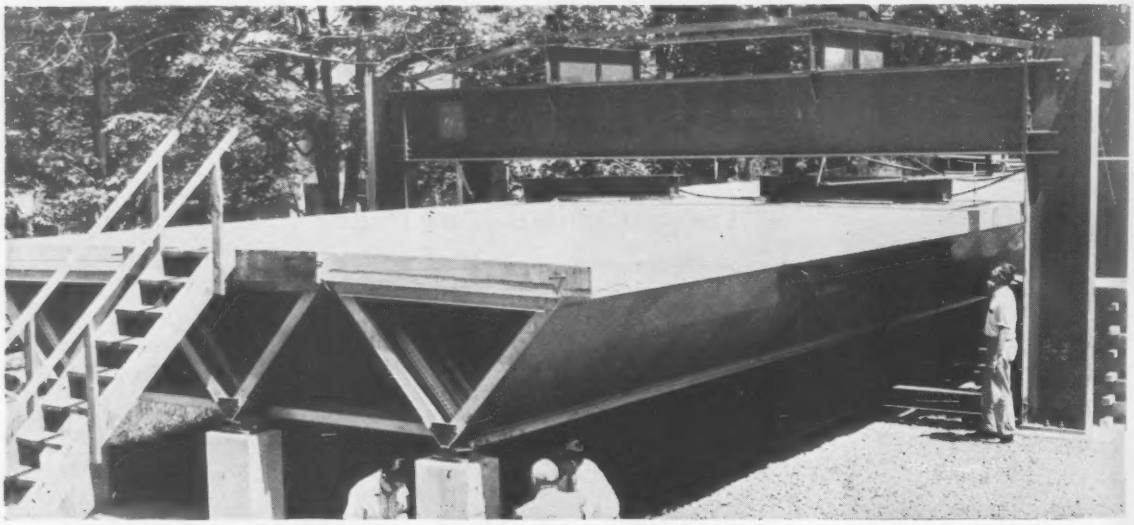
"We'd like to get bridge prices down the way the cost of bridge rail went down. Aluminum rail dropped from $18 to $12 a foot in the three years since we've been using it, and steel rail went down with it.

"And aluminum bridges aren't supposed to need any maintenance. In the Long Island climate, steel bridges have to be painted every three or four years."

The four bridges are part of a pilot project that will explore the money-saving possibilities of aluminum. They are considered experimental rather than competitive.

The first two aluminum bridges are riveted plate girder spans. When they are completed this spring they'll resemble conventional steel structure, except for their silver-grey color.

The other two aluminum alloy bridges will be unlike any existing spans. They will be semi-monocoque structures, their design based on principles used in aircraft construction.



Prototype sheet aluminum bridge withstood loads up to 175% of design load.

1. Thin Alloy Skin Carries Most of the Load

The New York State Department of Public Works will make a down-to-earth application of airplane construction principles this spring when it lets contracts for two aluminum alloy bridges over the Sunrise Highway in Amityville, Long Island.

The bridges will be built like an airplane fuselage, in which the outer skin is as essential to the structure as the inner framework.

The two Amityville bridges will be made up of hollow, triangular beams. The beams will consist of rolled aluminum sheets as thin as ⅜ in., riveted to long, specially extruded alloy angles.

These triangular beams, 7 ft wide and 3½ ft deep, will be bolted together at the corners, base up, and a bottom cover or plate of aluminum sheet will be attached. All spans of the bridges will be made up of 12 of these beams connected side by side.

A cross-section of the aluminum in one of these spans will resemble a Warren truss or the wing of a giant airliner. The design idea isn't new. The novelty lies in its application to highway bridges.

The two Amityville bridge designs are almost identical. Both are 212 ft long and 96 ft wide; have two 76-ft center spans and 30-ft end spans. They will be erected about four miles apart, east and west of Amityville.

The bridges are designed as composite beams. Shear connectors will enable a reinforced concrete slab to act in conjunction with the aluminum to resist live and impact load.

The component triangular beams are made of 0.081-in.-thick rolled aluminum sheet on the sides and 0.032-in. corrugated sheet on the top. The bottom plate, of 0.102-in. aluminum sheet, completes the structure.

The corrugated sheet will run longitudinally on the top of the beams. No falsework will be used during the erection of these bridges and the aluminum must carry the dead weight of the concrete when it is placed for the 6-in. slab. The corrugated sections act as stiffeners until the concrete hardens and the bridge spans become composite structures.

The bottom sheets are not protective covering, but the actual tension areas of the cross-section.

Stiffeners riveted to the sheets inside of the beams are extruded aluminum bulb angles. They will be spaced at intervals ranging from 6 in. at the ends to 9 in. at the center.

The superstructure will be made of an aluminum alloy known as 6061-T6.

The DPW specifications for the bridges call for "an approved semi-monocoque design" for the superstruc-

Both of Them Call for Aluminum

ture. A true monocoque structure is a shell, the skin of which is stressed. In a semi-monocoque structure, the skin is braced with stiffeners or diaphragms for additional strength.

A bridge of the type specified by DPW was designed and built by the Kinetics Division of Fairchild Engine & Airplane Corp., Hagerstown, Md. It was tested at Lehigh University and was able to withstand loads of up to 175% of the designed vehicular load limit (ENR Sept. 4, 1958, p. 25).

The Kinetics Division is now separate from Fairchild. It is known as International Aluminum Structures, Inc., New York City.

The triangular beams will be shop fabricated, joined with cold-driven rivets of 6061-T6 alloy. A 7-ft-wide bottom sheet will be attached to the apex of each triangular beam at the center of the plate. In cross-section they will look like a V. The fascia beams will have 3½-ft plates attached at the edge. These components will be joined together on the abutments with aluminum alloy lock bolts.

The slab will be cast directly on the corrugated aluminum top sheets. No formwork will be needed. Specifications call for an anti-corrosive coating of zinc chromate on any aluminum that will be in contact with concrete. A 2½-in. layer of asphaltic concrete will cover the slabs.

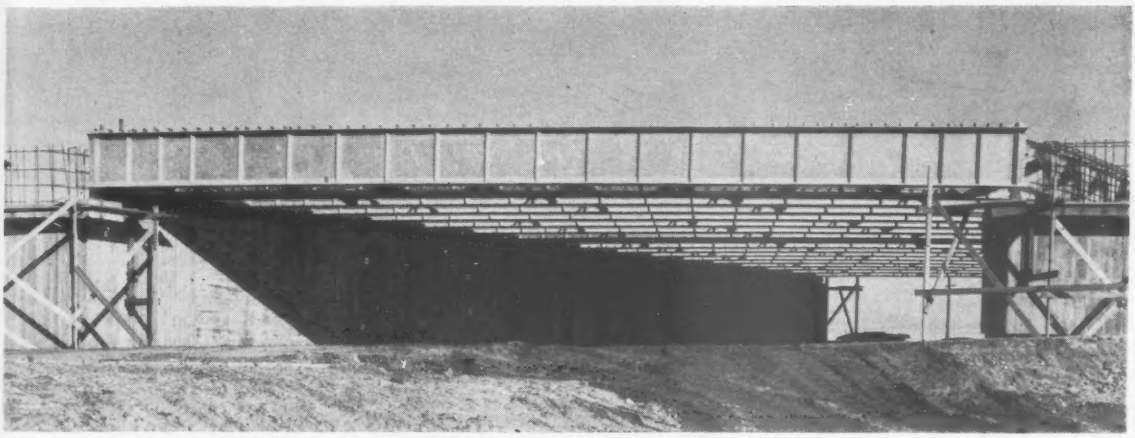
The thermal expansion of aluminum is about twice that of concrete. The problem posed by this difference in a composite beam of aluminum and concrete is solved in the Fairchild bridge by the use of thermal beams.

The thermal beams run the full width of the structure in the region of the bulkheads. They react over the entire thermal loading, producing longitudinal force and additional moment between aluminum and concrete it is claimed.

The aluminum superstructure of each 96 x 212-ft bridge will be 356,000 lb, approximately 17.5 psf. This low weight will permit erection of a superstructure in about a week with lightweight equipment, according to Harry Kahn, a vice president of IAS and one of the designers of the Fairchild bridge.

Mr. Kahn says that reduced superstructure weight will also allow constructors to build smaller abutments and, in the case of pilings where soil offers poor support, fewer piles.

The contract under which the two aluminum bridges will be built will also include a steel bridge of similar size. This will give DPW a source for comparison.



These aluminum girders weigh only one-third as much as comparable steel girders.

2. A New Material for a Traditional Design

The first two riveted aluminum-alloy girder highway bridges in the United States are under construction for the New York State Department of Public Works in Nassau County.

The 35 built-up aluminum alloy girders that make up the two bridges weigh only one-third as much as steel girders of similar capacity. Their bright silver finish will turn to pewter grey as a film of aluminum oxide covers the exposed alloy. This tough film should prevent further corrosion and make periodic painting unnecessary.

The total amount of structural aluminum in the two bridges is 270,000 lb, or about 14 psf of bridge, exclusive of railing. The unit bid price for the aluminum was 96 cents a pound erected in place.

The two bridges, both 79.75 ft long, both built on a 31 deg skew, will carry the Long Island Expressway over the eastbound and westbound roadways of the Jericho Turnpike. Completion is expected by late spring.

The Department of Public Works picked this site for the aluminum bridges because it is typical of the locations of many medium span bridges in an area where vertical clearances are critical and large skews are common.

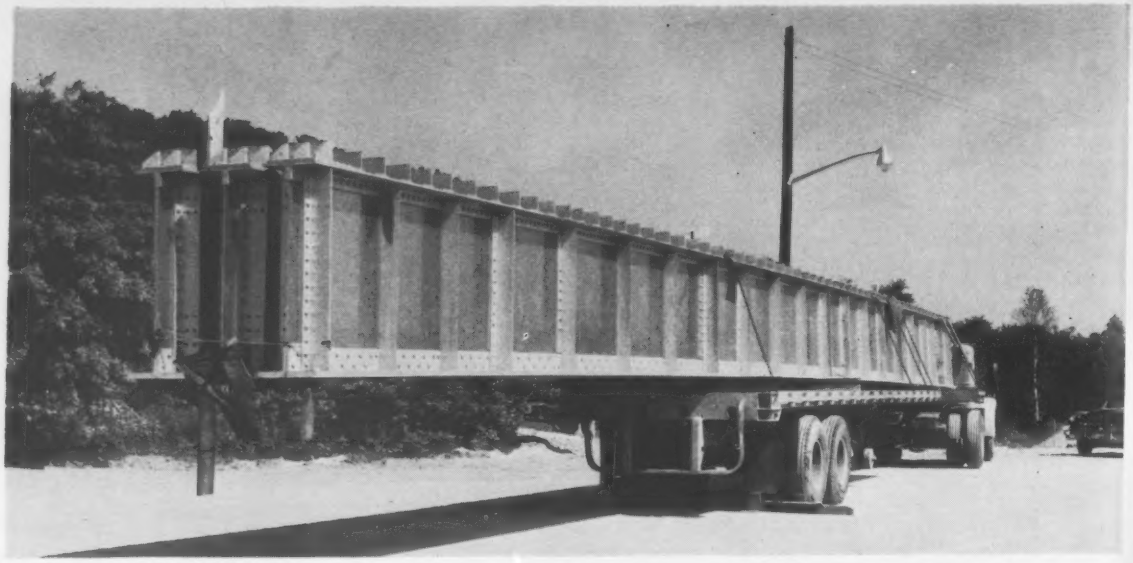
All girders except three of the four fascia girders are 4 ft deep. As a comparison, 3-ft-deep girders would have been needed for a steel bridge. The girders, placed on 7-ft centers, act integrally with a 7-in. concrete slab to support the live load and a 2½-in. asphalt concrete paving.

The bridge over the eastbound roadway is 120 ft wide and includes two parking strips. The span over the westbound route is 114.5 ft wide and has only one parking strip. The three fascia girders that support the parking strips are 4.5 ft deep.

The two pioneer structures are made of a heat-treated magnesium silicon aluminum alloy designated 6061-T6. It is 98% aluminum by weight.

Special dies were developed to produce the large extrusions for the flange angles of the bridge. The extrusion for the bottom flange angles has an area of 15.5 sq in., one of the largest produced in this country for non-military use. Angles for the girders were ex-

By A. A. Trinidad, Jr., of Andrews & Clark, New York City consulting engineers. Mr. Trinidad was project engineer for the riveted aluminum girder bridges.



CHEAPER TRANSPORTATION to site is possible with aluminum girders, because trucks can carry three at a time.

truded to their full length to avoid splices.

The bottom flanges have an outstanding leg 1½ in. thick and 8 in. long. The attached leg is ⅝ in. thick and 7 in. long. The top flanges have an outstanding leg ¾ in. thick, 7 in. long and an attached leg ⅝ in. thick, 4 in. long.

The girders are designed to carry the H20-S16-44 live load. Their 4-ft depth was needed to satisfy the maximum live load deflection requirements of 1/800th of the span. Without the composite action of the slab, aluminum's comparatively low elastic modulus, 10 million psi, would require a depth of 5 ft. The low elastic modulus enables the aluminum to work very efficiently with concrete in a composite beam compared with a steel-concrete composite beam.

Galvanized steel shear connections, riveted to the top flange, transfer the live-load stresses between the slab and the girders. Special galvanized welded steel shear connectors are riveted to the ends of the top flange to transfer thermal forces.

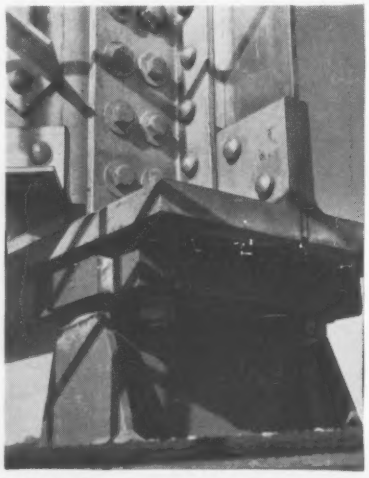
The coefficient of thermal expansion for the 6061-T6 alloy is twice that for steel and concrete. As a result, the force produced by a temperature change in a composite aluminum and concrete girder is considerable when relative movement is prevented. The special end shear connectors are designed to transfer forces produced by a change of ±60F from the temperature at the time of construction.

On a hot summer day the aluminum girder will expand at a faster rate than the concrete slab. This produces a small amount of tension in the slab. Extra longitudinal reinforcement is used in the concrete to take care of this. Under these conditions the aluminum top flange is in compression. This results in a small downward deflection of the composite beam. A decrease in temperature reverses these effects.

Wet concrete in contact with aluminum alloy has only a mild surface etching effect. The top flanges of the girders of the Long Island Expressway bridges are painted with zinc chromate to reduce this mild attack to a minimum. To minimize surface stains, specifications required that girders be washed with water while the concrete deck is placed in waterproof forms.

All aluminum surfaces in contact with steel shear connectors and bearings were coated with zinc chromate primers. Steel bearings in contact with the aluminum flanges were painted with priming paint and then a paint containing aluminum paste pigment.

Cold-driven ¾-in.-dia rivets of 6061-T6 alloy were used for the shop connections of flange angles to the web and shear connectors to the top flange.



FLANGES were extruded from special dies.

All field connections are made with ¾-in. dia aluminum coated steel bolts.

A high degree of accuracy and care had to be maintained throughout fabrication. Parts spoiled by errors in punching, drilling and shearing had to be replaced. Welding was not permitted with this alloy.

The fabricator was allowed to shear, saw, or cut with a router material that was ½ in. thick or less. Sawing was used for material more than ½ in. thick. Flame cutting was forbidden.

Specifications provided that all rivet holes be subpunched or subdrilled and reamed to finish size. Punching was not allowed if metal thickness was greater than the diameter of a hole. Holes had to have a finish diameter not more than 4% greater than the nominal diameter of the rivets.

The author, with G. W. Zalite and E. I. Ziegler, all of Andrews & Clark, New York City consulting engineers, prepared plans and specifications for the two bridges. The designers began their project about three years ago.

Hendrickson Brothers, Inc., Valley Stream, N. Y., are general contractors for the job. Pullman Standard Car Manufacturing Co., Chicago, fabricated the girders. Edw. G. McDonnell Rigging Co., Inc., Point Lookout, N. Y., erected the bridges. W. J. Corr is the Department of Public Works engineer in charge.

The design and fabrication specifications follow closely the Specifications for Structures of Aluminum Alloy 6061-T6 published in 1956 by the American Society of Civil Engineers as Proceedings Paper No. 970.

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Prestressed Girders Carry Roof

Concrete control was the key to building an ingenious two-way lattice roof girder system for the Munson-Williams Proctor Institute, Utica's newest art gallery.

Four intersecting girders provide a column-free interior above the main floor. Cast-in-place and post-tensioned, they carry not only the 117-sq-ft roof area, but also a 30-ft-wide balcony hung 18 ft below.

Exterior concrete wall-girders, 31 ft deep and 11 in. thick, are supported on eight exterior columns. They cantilever 30 ft beyond the columns to the corners and provide exterior support for roof, balcony, and main floor framing.

Roof girders are inverted tees, 129-in. deep, with 22-in. webs and 34-in. flanges. Two girders span east-west, and two span north-south between the eight exterior columns. They form nine rectangular roof areas: four corner bays 30 ft sq, four side bays 30 x 57 ft, and a central bay 57 ft square.

Precast double-tee roof sections span the 30-ft dimension of the eight exterior bays, bearing on exterior walls and on 6-in. flange lugs at the bottom of the girders. Twelve cast-in-place tapered ribs, 50-in. deep, span each direction in the central bay, forming a coffer. Plexiglass domes cover the 45-in. sq. openings, admitting natural light to the gallery floor below.

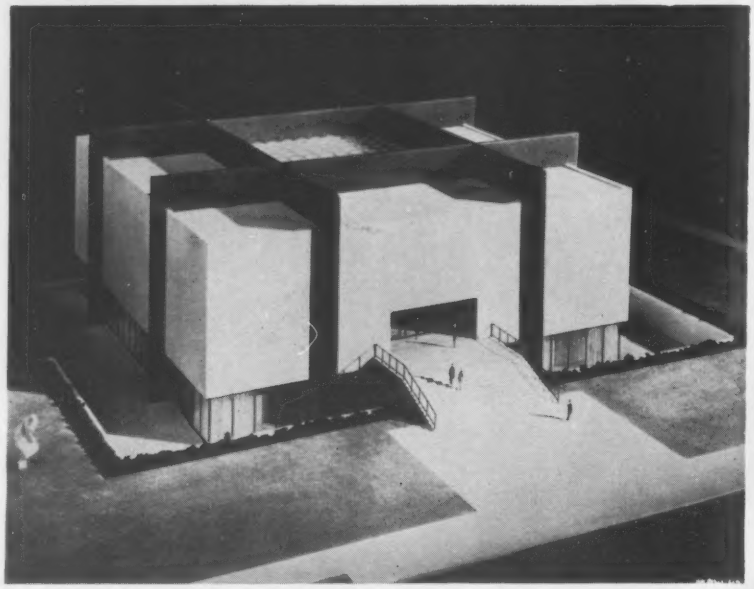
Balcony framing consists of 10-in. one-way slabs spanning 30 ft between the exterior walls and four shallow beams framing a 57-ft-sq interior opening. Sixteen 2½-in.-dia steel rods, hung from the prestressed girders above, support these balcony floor beams.

The consulting engineer, Lev Zetlin of New York city, specified a monolithic pour for the roof framing to avoid construction joints, which might reduce compressive strength of the prestressed girders.

Some 350 cu yd of concrete—the four girders and the central coffered section—had to be cast in one day. Under this condition, concrete for the prestressed girders had to meet these requirements:

- Ultimate strength of 5,000 psi at 28 days.
- Slow initial set, to avoid cold joints in the long casting operation.
- Good workability, to prevent honeycombing and voids in the deep girders crowded with reinforcement, sleeves, and cable conduit.
- Rapid development of creep, to obtain full girder deflection as soon as possible.

The admixture selected for the mix reduced water-cement ratio, increased workability, and entrained air for protection against damage from freezing and thawing.



Roof girders provide column-free interior for art gallery.

Monolithic pour of girders continued until midnight.

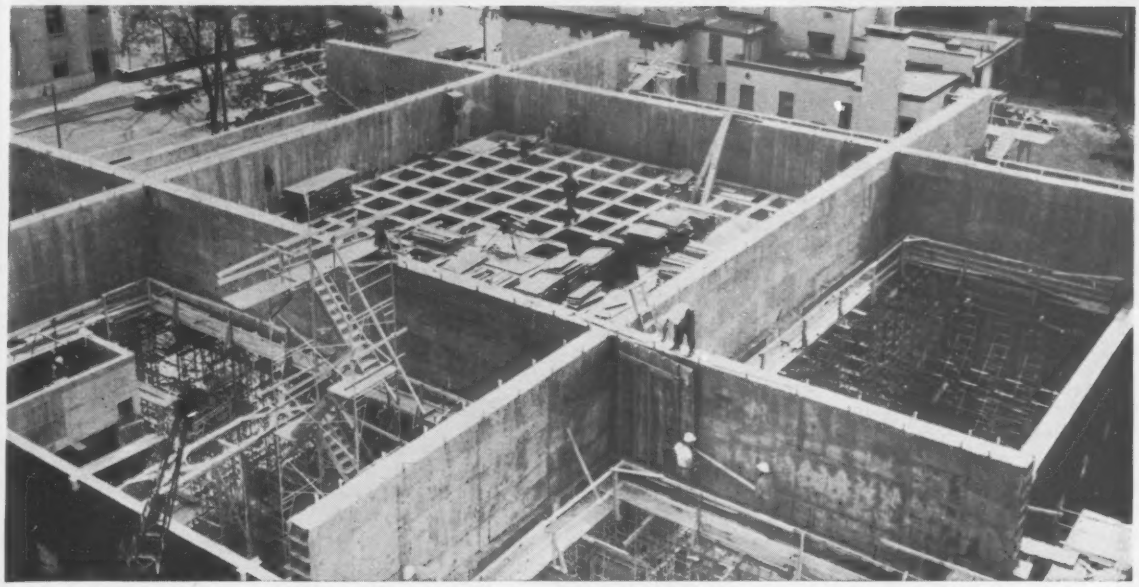
Concreting the roof required 16 hours, from 8 a.m. until midnight. Two crews, each handling concrete from a one-yard crane bucket worked from adjacent corners across the building. A third crane and another crew joined in at 5 p.m. and stayed to the finish.

Workers eased concrete into the deep girders through elephant trunks to prevent segregation. They had to vibrate thoroughly to work concrete into the 6-in. flange lugs that support the precast roof framing at the bottom of the girders. Extreme care was necessary to avoid damaging the conduit for the prestressing tendons.

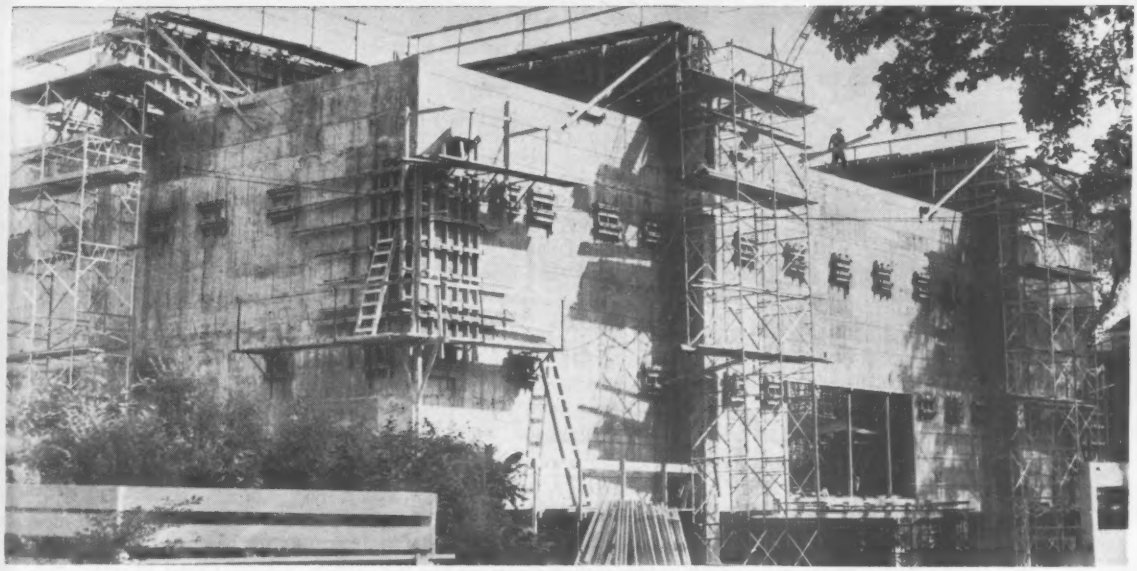
Concrete slump varied from 3½ in. at the start to 2½ in. during later stages of the operation to assure a uniform setting rate.

Crews post-tensioned the girders two weeks after casting when the concrete had attained a strength of 4,000 psi.

oofand Hung Balcony



Girders were cast in a continuous 16-hour pour with high-early-strength concrete.



Deep exterior wall-girders cantilever 30 ft beyond columns to corners.

(Actual average strength of test cylinders at 14 days was 4,985 psi.)

Workmen threaded prestressing tendons through 14 2-in.-dia flexible steel conduits arranged in two rows of seven each and draped in parabolic curves.

Tendons consisted of 25 ¼-in. dia wires banded together. Threading them through the conduit was delayed until after concreting. This averted the danger of kinks or bends hampering movement of the tendons in the conduit. Workmen lubricated them with liquid detergent to ease them through the conduit. Tendons were pressure-grouted inside the conduits after post-tensioning.

Tendon anchorage works on the bearing principle. Two upsets at each end of the individual wires bear against anchorage hardware. This hardware consists mainly of a split holding ring at the interior upset and a split-cone fitting inside a stressing adapter at the extreme-end upset. Threaded to a pulling rod inside a hydraulic ram, the adapter transmits the jacking force to the tendon and tensions it.

Mr. Zetlin specified an initial jacking force of 218 kips for each tendon to offset losses from steel creep and cable friction resulting from curvature of the conduit. This is 25% over total design tension, which is 175 kips at a working stress of 140,000 psi. Creep losses over the years should reduce the initial prestress asymptotically toward the design stress.

Prestressing added ¼-in. upward de-

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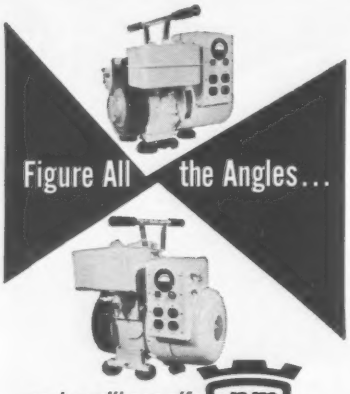

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Workman lubricates tendon to ease it through conduit.

flection to the 2-in. camber built into the formwork. It also shortened each girder $\frac{1}{8}$ in. To prevent this $\frac{1}{8}$ in. movement from cracking exterior walls and columns, the consultant designed a curve-surfaced cap plate for the column and a plane-surfaced bearing plate for the girder. Both plates were highly polished and lubricated. Measurements after prestressing showed zero deflection in the columns. The plates were then welded together.

Girder deflection under dead load was $\frac{3}{4}$ in. During the next year creep will bring the girders down another inch. Under sustained creep over the years the framing will approach horizontal position.

Another outstanding design feature is two reinforced concrete stairways of two flights each from main floor to balcony floor. Cantilevered off the balcony slab and supported at the bottom flight, these stair slabs are unsupported at the intermediate landings. They are analyzed as folded plates under torsion.

Typical main floor framing is 8-in.-thick flat-plate construction carried on interior columns in 18 x 18 ft bays. But over the auditorium, which is at ground floor level, a 19-in.-deep waffle slab frames a column-free area approximately 60 x 50 ft.

The building also has a framed ground floor supporting the 300-seat auditorium and a basement and subbasement slab-on-ground.

Mr. Zetlin provided control of shrinkage cracks in the superstructure by leaving a 3 x 20 ft diagonal strip at the corner of each floor unpoured for a two-month period. After this period, during which almost all shrinkage occurred, the contractor concreted the open areas.

This same method of controlling shrinkage cracks was applied to the walls. The contractor left 3-ft wide corner sections open full height and poured them two months after the original concreting operation.

Lightweight concrete, weighing 110 lbs per cu ft, was used in all parts of the superstructure except the prestressed girders.

The contractor had to blast a hole 200-ft in diameter and 45 ft deep to excavate for basement and foundations. Some 18,000 cu yd of shale were removed before spread footing foundations could be cast.

The architect, Philip Johnson Associates of New York City, specified Black Canadian Granite veneer for the exterior walls. The columns, which project beyond the wall face, and the girders, which project above roof level, will be sheathed in bronze.

General contractor on the $2.5-million project is George A. Fuller Co., New York City. Prestressing subcontractor is Pre-Stress, Inc. of Albany. Bice & Baird of Utica are supervising architects.

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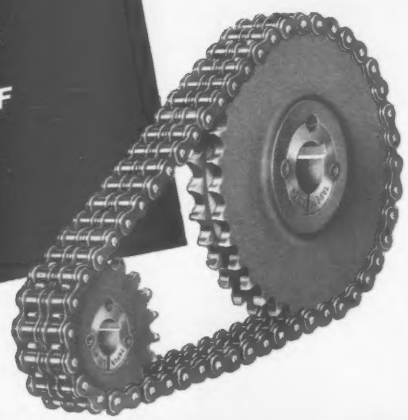

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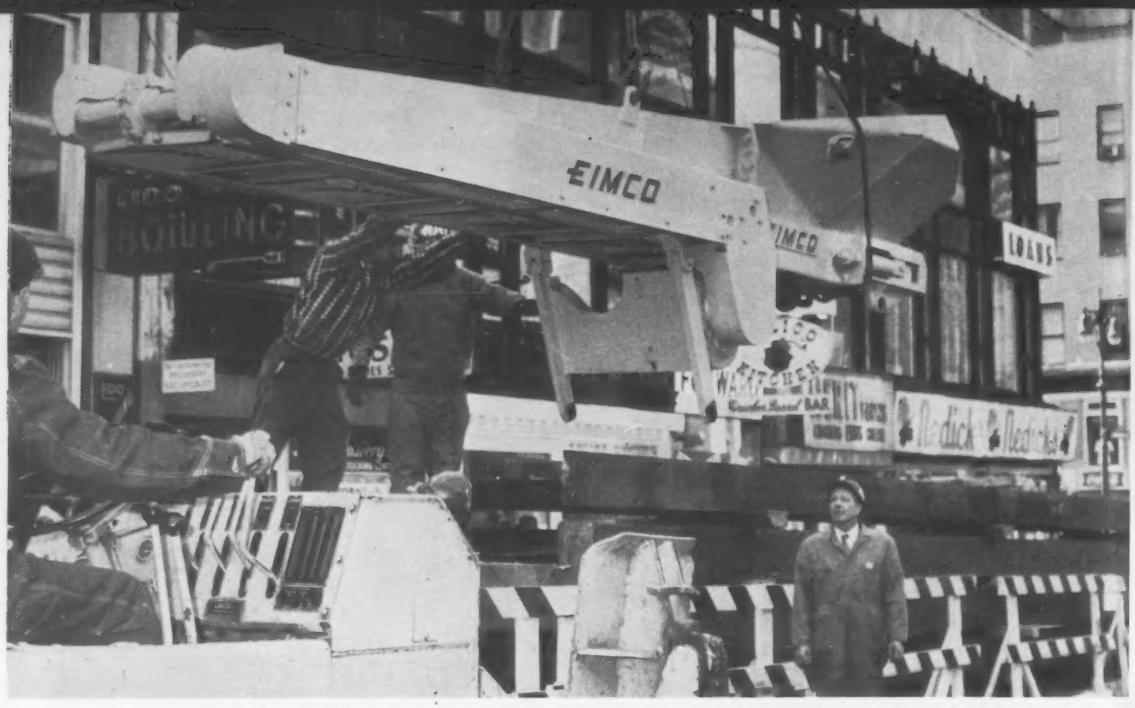


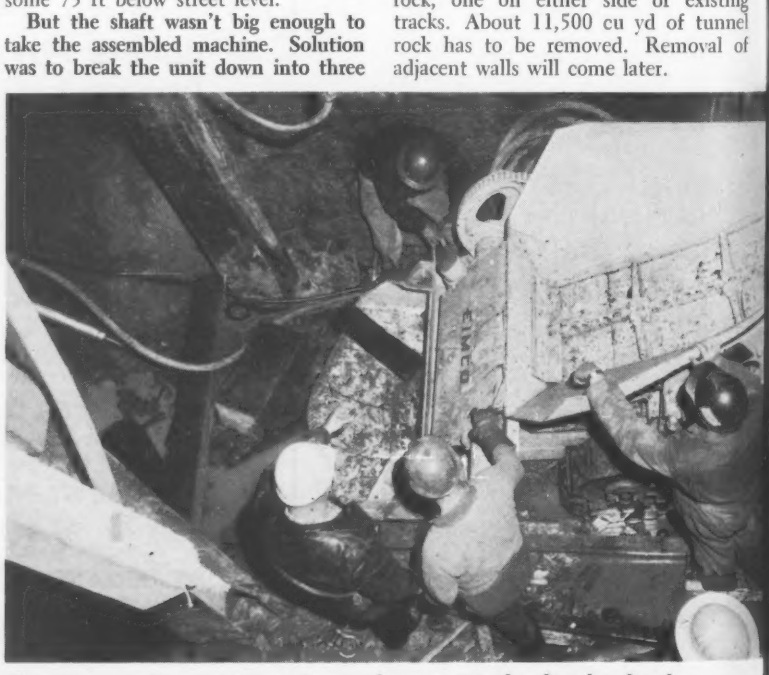
At street level, parts of a loader (conveyor above) were lowered through narrow shaft . . .

Problem: Small Shaft, Big Loader

Slattery Construction Co. wanted to make use of a continuous loader to handle rock blasted from an excavation for a new subway platform in New York City. A shaft had been sunk to the level of the proposed excavation, some 75 ft below street level.

But the shaft wasn't big enough to take the assembled machine. Solution was to break the unit down into three major segments and lower these, one at a time, down the shaft.

Working in very tight quarters, the machine was reassembled and put to work. A major portion of the project consists of two 520-ft tunnels through rock, one on either side of existing tracks. About 11,500 cu yd of tunnel rock has to be removed. Removal of adjacent walls will come later.



Then, 75 feet down . . . in cramped quarters, the contractor's workmen put the loader back

the bucket comes next . . .

and then the crawler body.

Solution: Lower It in Sections

Four shafts have been sunk and the tunnels will be dug in two directions from the bottom of each shaft as the work progresses.

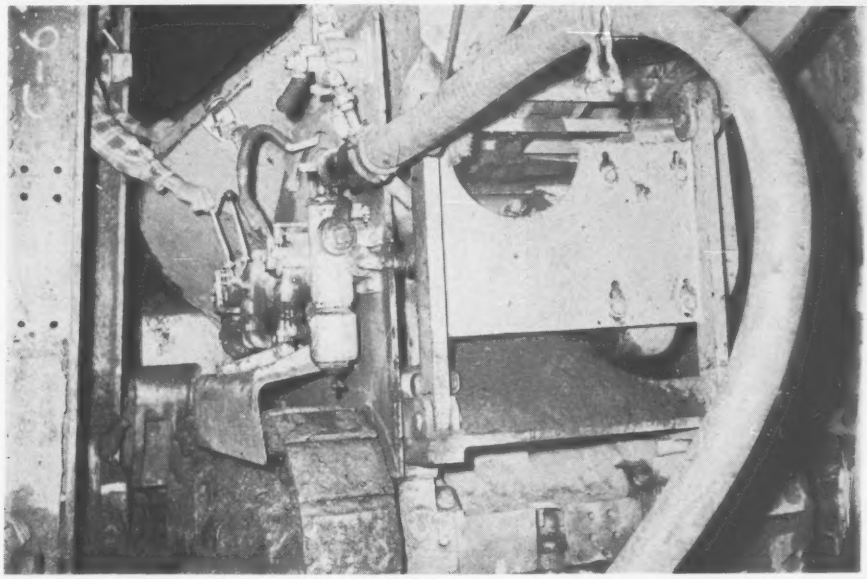
The contractor is getting one shot per shift. From 5 to 6 ft of tunnel face is blown out by each blast; the tunnel cross-section is about 8 ft by 10 ft.

The loader mucks the rock after the blast, carrying about 1½ cu yd in the bucket and conveyor back to the bottom of the shaft. Material is loaded into boxes and hoisted up to street level for disposal.

Slattery is doing the job for the New York Transit Authority at a contract price of about $5.7 million. Work began last June and will be completed in three years.

Slattery's project is one of several currently in progress on New York's subway system. Another platform extension is being done by the Cayuga Foundation Corp. of New York at a contract price of $5,616,000. Recently awarded is a contract for $4,526,250 for a third section of the Chrystie Street Subway in Manhattan; it is a joint venture of Arthur A. Johnson Corp. and Peter Kiewit Sons Co.

together again . . .



and start mucking rock from the tunnel shaft.

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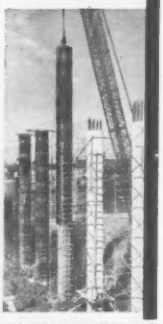

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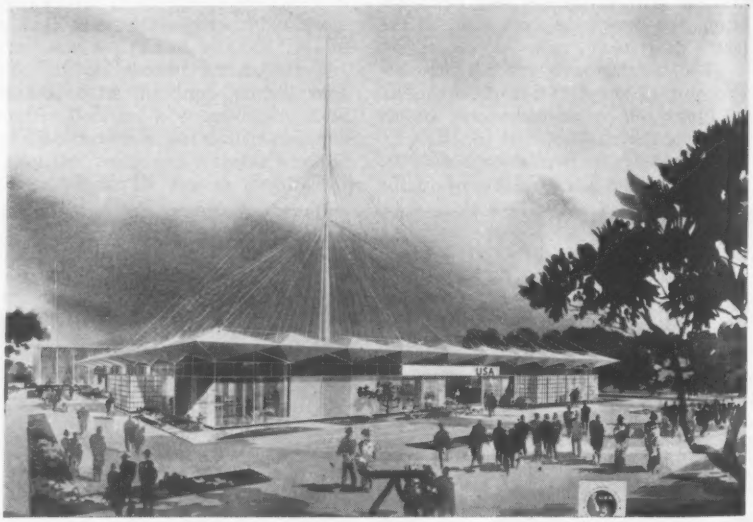
Red China Builds Yangtze Span

The mile-long, double-deck bridge carrying railway, highway and pedestrian traffic over the Yangtze River at Wuchang, China, has been opened to traffic.

The bridge cost $33 million and was built with the help of engineers from the U. S. S. R. It is said to be the first steel bridge to be erected over the turbulent Yangtze (ENR Sept. 19, 1957, p. 46).

Reinforced concrete caissons sunk to bedrock and filled with concrete support the bridge. Towers at each end house stairways and elevators to give pedestrians access to the upper deck.



Traveling Buildings for Fairs

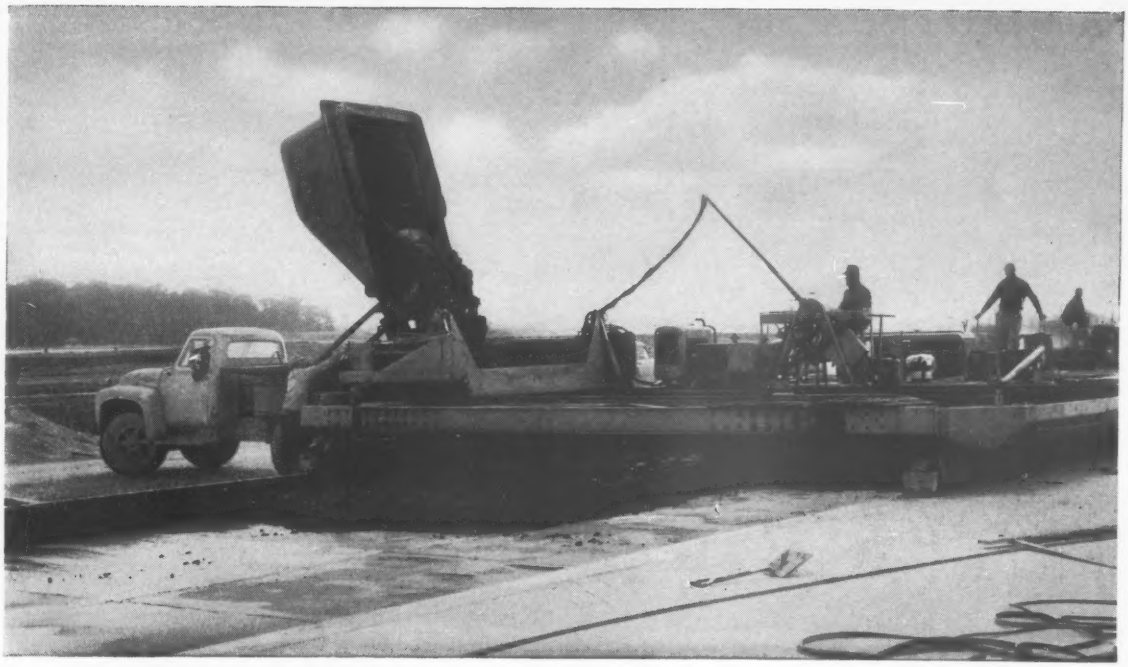
Two portable buildings will represent the U. S. at fairs to be held in Casablanca, French Morocco, and Izmir, Turkey, next year.

One of the buildings, square in plan, has a nylon roof with pyramidal sections supported by tensioned cables strung from a slender tower (see sketch). The other building, circular in plan, is roofed with a geodesic dome made of nylon. Both buildings are collapsible.

The U. S. Department of Commerce selected Philadelphia to represent the U. S. and to tell its port-development story to the Middle Easterners.

Designers were Carreiro Design Associates, with Charles E. Broudy as supervising architect.

RUNWAYS or HIGHWAYS



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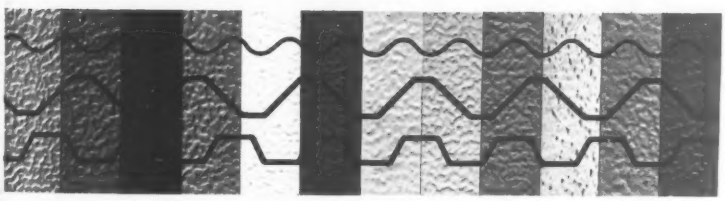

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Bids to Be Invited for Morocco's First Steel Mill

The Moroccan government will accept international bids soon for the country's first steel mill complex. The $60-million project is expected to revolutionize Morocco's economy.

Construction on the steel plant is scheduled to begin during 1960. The project also will include construction of a ferromanganese unit, two railway lines and a seaport.

The site will be Cap de l'Eau, a tiny fishing village on the Mediterranean, about 15 miles west of the Algerian border. This port was selected because of its proximity to high-grade iron mines at Nador.

Construction is expected to be completed within three years. Initial output of the mill would more than equal the 120,000 tons of steel that is currently being imported.

Soviet Textile Plant Gets U. S. Equipment

The Soviet Union will build a $10-million textile plant next year at Kalinin, midway between Moscow and Leningrad, and equip it with $20 million of equipment purchased in the U. S.

The equipment contract is the largest between American companies with Russia since before World War II. Intertex International, Inc., New York City, signed the agreement for a group of more than forty American manufacturers. The American group will install the equipment; the Russian government will handle all plant construction.

The Russians plan to build a multistory plant according to Intertex. This contrasts sharply with current U. S. practice of planning industrial production in single-level structures. The Soviet plant will probably contain 475,000 to 550,000 sq ft of floor space.

Funds Available for Travel To Science Meeting Abroad

The National Science Foundation has limited funds available to pay the round-trip fare of qualified engineers and scientists to certain international meetings abroad.

Two such conventions coming up this year are the Second World Congress on Earthquake Engineering in Tokyo and Kyoto, Japan, July 11-18, and the Tenth International Congress of Applied Mechanics, IUTAM, in Stresa, Italy, August 31-September 7.

Application forms are available from NSF's Division of Mathematics, Physics and Engineering Sciences, Washington 25, D. C.

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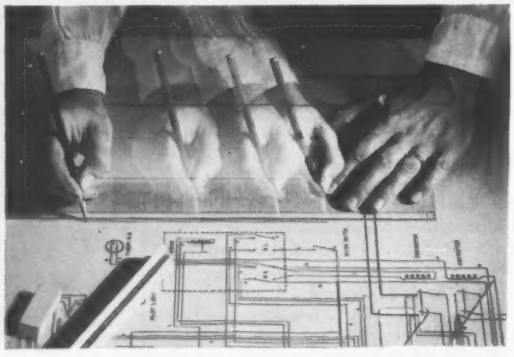

2 CRONAFLEX Drafting Film erases easily, without ghosting, yet there is less smudging. It comes matted one or two sides, and is available in either rolls or sheets.

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This means that every sheet of CRONAFLEX Drafting Film has the same excellent pencil acceptance, the same erasability, the superb matte surface, the .004" thickness which has been found ideal for drafting and filing.

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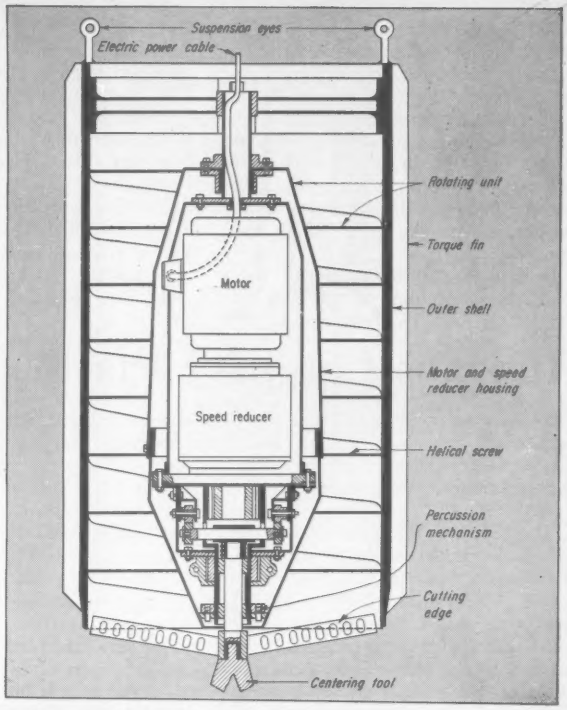
The big "barrel" unloading spoil is an auger.



Boring machine parts are shown in cutaway.

Self-Contained Earth Borer Developed

A self contained earth boring machine that cuts holes of any depth without the use of a kelly bar, auger shaft extensions, outside hammers, heavy leads or cumbersome rotation equipment, has been developed by a French firm.

The unit, which is electrically operated, is called the Crapez Electric Boring Machine. It is said to be effective for cutting 20- to 40-in. dia holes in most soils and in soft rock. The machine uses both rotary and percussion principles in its drilling, but does not require a heavy tower or a drill rig for its operation. It can be handled by any crane capable of lifting 2½ tons—or it can be worked from a truck-mounted boom.

Tests made in Europe with two prototypes of the machine indicate that in sand it can dig a 40 in. hole up to 33 ft deep at the rate of 28 ft per hr. In earth the rate is 27 ft per hour; in soft limestone, 33 ft per hr.

From an external view, the boring machine looks like little more than a length of large diameter pipe. Actually it consists of three main elements: a water-proof drive mechanism; a boring assembly; and an outside housing.

The drive mechanism on the two prototypes tested comprised a 1,400-rpm. electric motor, a speed reducer and a percussion mechanism. The motor was 25 hp and asynchronous, and worked on a 50 cycle, 380 volt, three-phase current. (On working models, the motor characteristics can be determined by available current).

The speed reducer was planetary and had a 40 to 1 reduction ratio.

The percussion devices on the two units varied. On one, two mobile rollers are attached horizontally on opposite sides of the centering tool shaft, above the centering tool. Immediately beneath these rollers are eight pairs of fixed rollers, which serve as a camming surface. During rotation of the auger the movement of the upper rollers over the lower raises and drops the boring unit creating an impact cycle of 272 blows per minute. On the second machine, considered more efficient for hard digging, an impact cycle of 544 blows per minute was achieved by use of a cogwheel with slanted teeth passing over a corresponding cogwheel fixed to the frame.

The entire drive assembly is protected by a casing that remains waterproof under more than 66 ft of water. In the "short type" boring machine (see drawing) the drive assembly is mounted within the auger flights; in a standard model (not shown), it is mounted above the auger in the area of spoil storage. Operation of both models is the same, but the spoil storage area of the standard machine is greater.

The boring assembly consists of a tooth-equipped centering tool, which leads the machine and rips the earth or rock, and a multi-flight helical screw, which picks up the loose material and stores it until it is discharged.

The barrel-like outer housing serves as a main frame for the entire machine. At its top edge are mounted the eyes for suspension; along its side are two anti-torque fins, which resist the counter-rotational force set up by the auger.

• **How it works**—Operation of the Crapez Electric Boring Machine is simple. The machine, handled by a crane or truck boom, is spotted on location. For its first pass in each hole, the torque fins are held in a guide clamp mounted on the handling rig. The auger is started by the push of a button. The centering tool rips the earth, and the auger, turning at 34 rpm., picks it up. The spoil is carried up the auger flights until the drum is filled. Then the boring machine is raised from the hole, swung over the dump area or truck body and unloaded. The unloading is accom-

plished by throwing a single switch, which reverses the polarity of the current to the motor, and therefore the direction of the screw. On the prototypes, the averaging dumping time for a ¾-cu-yd load was three minutes.

After the initial cut in each hole, the torque fin guide is unnecessary. The fins cut a slot through the material beside the hole and the resistance of this material keeps the outer shell from spinning.

In hard digging, the cylindrical outer shell serves as a guide to maintain hole alignment and the borer works under a slack hoisting cable. This brings the percussion mechanism into full play.

In soft digging, the hoisting cable is kept taut; this aids in hole alignment and reduces the percussion action. When used in wet or running soil, an over sized cutting blade makes room for a casing.

The Crapez Electric Boring Machine is not yet available but it soon will be if the developer successfully completes negotiations for U.S. manufacturing and selling licensees.

Russians Compare Plastics

Russian building officials were impressed by the advanced state of the United States plastics industry after a two-week tour from Maine to California.

Their prime interest was finding ways in which plastics could help advance the housing program in the Soviet Union (ENR Nov 26, 1959, p. 32). The delegation didn't come to place orders for either material or production machinery. It will make recommendations at home for plastic development and production.

Here is a picture of Russia's plastics industry as it stands today, gathered from remarks made by the delegation members to ENR:

- They don't have—and badly need—high speed, continuous-process production equipment.
- Full-scale manufacturing is limited to wall and floor tile plus linoleum. They mentioned a sawdust-resin-bound board but didn't comment on how extensively it is produced.
- Plastic laminates and glass fiber products are running on pilot production lines only.
- There is no production yet of polyvinyl chlorides.
- Development work has only started in foam plastics.

Questioned about present production figures, the Russians would only quote expansion plans of the current seven year plan saying plastics production in general would be increased seven-fold and glass fiber products in particular would be increased 12-fold.

The seven-man delegation travelled from New York City to Washington, then up through New England and on to the coast stopping at plants in Ohio and Michigan on their way to Los Angeles. It flew back to New York before leaving for Moscow.

What interested them most during their trip?

- **Vinyl-asbestos floor tile and polystyrene wall tile.** The Russians had no idea there was so much of it in use here. They were equally surprised in not finding nearly as much linoleum as they had expected.
- **Continuous process production.** They commented particularly about a California company producing corrugated glass-fiber plastic sheet in a continuous process.
- **Laminated plastics.** Delegates were impressed by the volume production they had seen in both eastern and midwestern plants.

What is Russia's greatest problem in plastics? It's the weather. Temperature fluctuation and the severity of winter weather make plastics applications difficult in the construction industry, the Russians reported.

Water Purification Unit Can Be Dropped by Air

An air-droppable water purification unit to provide drinking water in areas not readily accessible to truck-mounted units has been developed by the U.S. Army Engineering Research and Development Laboratories, Fort Belvoir, Va.

The 600-gph unit is one of a family of three mobile units designed to purify water contaminated by radiation or ordinary pollution. Sectionalized to facilitate handling and transport, the airborne unit includes a water treating section a water filtering section, and operating accessories such as pumps, tanks, hose, generator and chemicals.

Heart of the unit is a conical welded aluminum tank in which mud, bacteria and other suspended matter in the water are coagulated and removed. This device is connected in series with a diatomite filter. Polluted water can be pumped into the unit and chemically and physically treated and discharged as potable water in less than 25 minutes. Only one operator is required.

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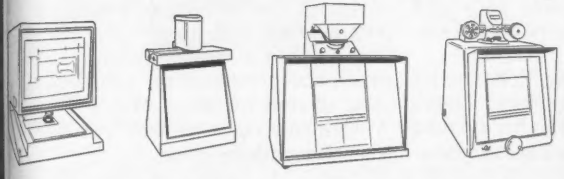

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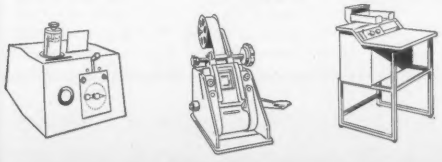

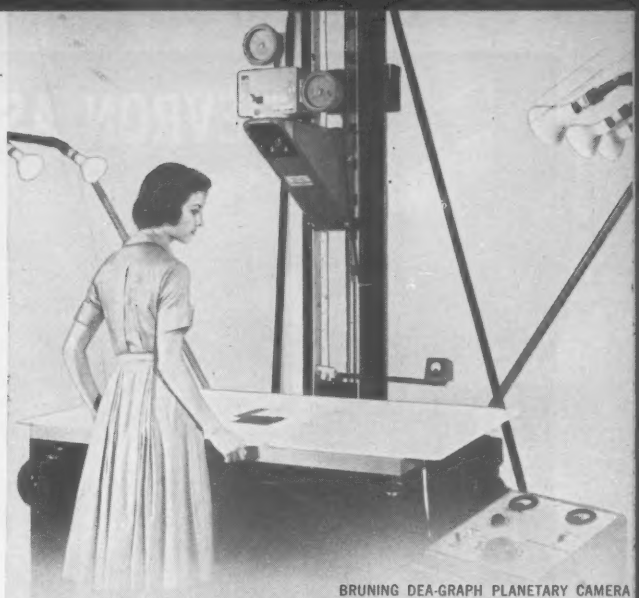

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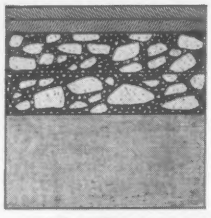
Nello L. Teer Company Job In North Carolina Includes Record Asphalt Paving Award



2-1" lifts Type I-2AC Wearing Surface

2-3" lifts "Black Base"

7" to 12" compacted mechanically stabilized base

CROSS SECTION VIEW OF PAVEMENT CONSTRUCTION

On Interstate Route 95, North Carolina, the Nello L. Teer Company, of Durham, North Carolina, is the prime contractor on a highway construction project that includes the largest asphalt tonnage contract ever awarded by the North Carolina Highway Dept.

This project fittingly crowns 50 years of activity in the construction field by the Teer Company.

The job called for new construction of divided pavement each side 24' wide, south from the Harnett County line 14.55 m. to a point 5 m. north of Fayetteville.

The paving contract covered the placement and compaction of 7" to 12" of mechanically stabilized base; placement and compaction of Asphaltic Concrete "Black Base" course in two 3" lifts; and placement and compaction of Type I-2 Asphaltic Concrete wearing surface in two 1" lifts. Asphalt surface treated shoulders were provided full length over a mechanically stabilized base.

Overall, the "Black Base" and I-2 Wearing Surface required 210,000 tons of Asphaltic Concrete.

All work is being done under Project 8.13438. Sponsor: North Carolina State Highway and Public Works Commission. Resident Engineer: H. B. Smith; Division Engineer: J. W. Spruill, 6th Division, Fayetteville, N. C.

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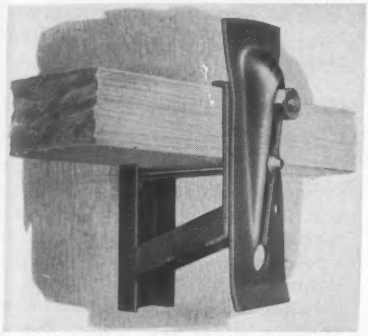
Shovel-Loader for Motor Graders

A one cu yd shovel loader attachment for Caterpillar motor graders mounts on the front of the grader. Two belts and a transverse pin fasten the unit to the grader frame without interfering with scarifier or other operations of the basic machine. Installation or removal of the loader is said to be simple and quick.

Principal application is for loading excess windrow material on highway maintenance jobs. Other applications are materials handling, backfilling, snow removal and general stockpiling. Reach height is 11 ft.

The loader is hydraulically operated by a two-lever control valve mounted at the side of the grader control panel. MARTIN COMPANY, 620 ANDREWS AVE., KEWANEE, ILL.

Snap-On Form Tie: No Nailing



Faster and easier forming for concrete construction is made possible with a newly developed "snap-tie holder" used with ¾ in. plywood sheathing where single liners only are applied. It can also be applied to vertical studs on forms where wales are not used, according to the manufacturer. No nailing is necessary. In application, the opposing holes are drilled in the plywood and the snap ties inserted. Then when the liner is brought into place, the holder secures the ties and supports the liner. SUPERIOR CONCRETE ACCESSORIES, INC., 9301 KING ST., FRANKLIN PARK, ILL.

Diesel Engine Line Built For Light, Medium Trucks

A line of diesel engines ranging in size from 50 hp to 350 hp in three, four, six and eight cylinders includes models designed specifically for light and medium weight trucks, vehicles of up to 55,000 lb gross combination weight.

Several of the engines incorporate a diesel combustion chamber that permits operation with a wide variety of fuels, all grades of diesel fuel, kerosene, lubricating oil, gasoline and jet aircraft fuel. No adjustment is said to be necessary in changing from one fuel to another. HERCULES MOTORS CORP., 101 ELEVENTH ST., S. E., CANTON 2, OHIO.

McGraw-Hill Book News

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Just Out! Here is expert guidance in estimating requirements of a construction job, solving field problems, and operating and maintaining equipment. It gives tested methods on every phase of construction—data on equipment costs and output—valuable checklists. A time- and work-saving help for contractors, designers, engineers, etc. **Edited by F. W. Stubbs, Jr., Purdue Univ. 1040 pp., over 600 illus., $18.50**

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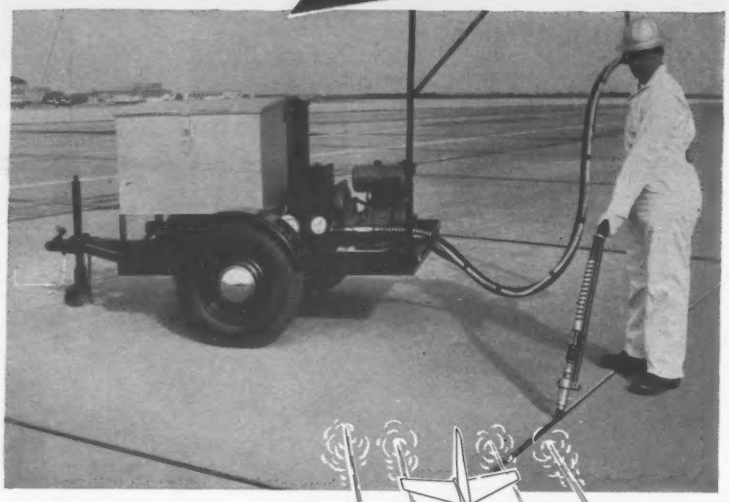

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Hydraulic Coring Machine For Concrete Pavements

An hydraulic pavement coring machine is designed for production-type test coring on highways, airport runways, and similar slabs. The drill may be mounted on any ½-ton truck or trailer. Mounting, removal, and set-up of the unit are said to be simple and quick.

The hydraulic drill motor will accommodate diamond bits from 2 to 10 in. in dia. The machine has three-way hydraulic drive that permits coring through reinforced concrete at the rate of 30 sec per in., according to the manufacturer.

Controls on the machine are said to maintain automatically correct drilling pressure and rate of feed. MOBILE DRILLING, INC., 906 N. PENNSYLVANIA ST., INDIANAPOLIS 4, IND.

Bucket-Type Earth Drill Now Has Crawler Tracks

Crawler tracks are an innovation on a series of self-propelled rotating-bucket-type earth drills. Other new features include a Kelly bar crown for more digging pressure on the bucket in hard earth; a hydraulically operated dumping arm for faster and safer dumping; and built-in hydraulic jacks to level and stabilize the rig for accurate drilling operations.

The rig weighs 20.4 tons. It has a 40-ft tower. It can drill holes from 1 ft to 10 ft diameter and as deep as 200 ft with the attachments available. A telescoping Kelly bar permits depths to 90 ft without drill stems. CALWELD, INC., 7222 E. SLAUSON AVE., LOS ANGELES 22, CALIF.

Concrete Batcher Control Checks Aggregate Moisture

The Moisture Matic Compensator System provides automatic compensation for varying degrees of moisture content of concrete aggregates at the weight batcher, according to the manufacturer.

Replaceable probes, mounted on, but insulated from, the weight batcher, register moisture content as aggregates fall from the storage bin. A meter-operated control valve maintains water-flow rate proportional to moisture content of the aggregates. Plastic counterweight containers collect the "compensating" water, which discharges into the mixer with each batch of aggregate. CONCRETE CONTROLS CORPORATION, 1012 E. GENEVA ROAD, WHEATON, ILL.

New crawler mounted Calweld Drills offer more!

More features... More digging power... More speed!

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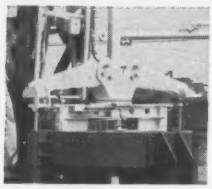
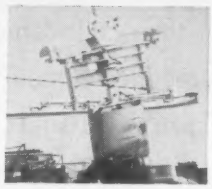
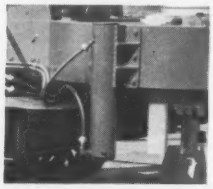


Hydraulic down pressure (50,000 lbs.) for faster digging in hard substrata.

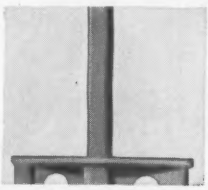


Hydraulic dumping arm for faster, safer dumping.

Hydraulic operated outriggers (box type).



50-ton capacity for pulling casings using hoist and crowder hydraulic rams.



Triple telescoping kelly bar for drilling to 90 foot depth.

Special bucket drills: rock grab, coring bucket, tungsten carbide rock drill and others.

In a class by themselves—Calweld Drills are BIG and do a *big* job—drill any size hole from 10 inches to 10 feet in diameter and 200 feet deep.

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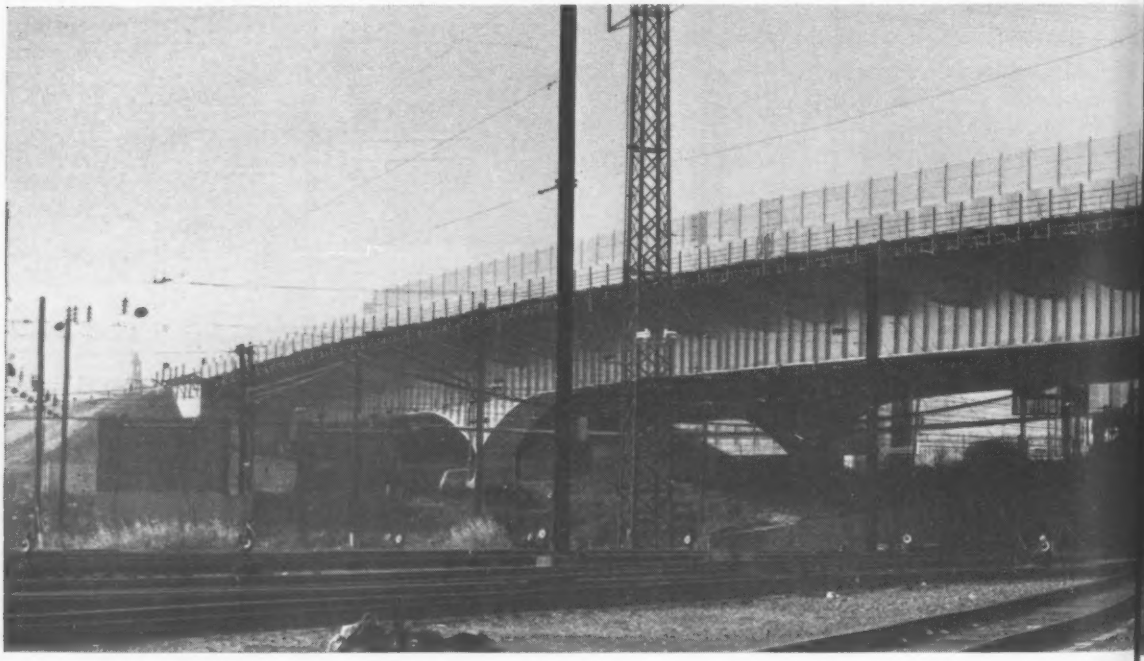
Write for 16-page illustrated Methods Manual for job facts and figures.

CALWELD DRILLS

CALWELD, INC. 7222 E. Slauson Avenue
Los Angeles 22, California

Featuring a 378′9″ span, this highway bridge constructed for the Connecticut State Highway Department in New Haven carries Route 34 over the NYNH&H Railroad tracks to a connection with the Connecticut Turnpike. It was designed by Dr. David B. Steinman and constructed by American Bridge—the same team that built the Mackinac Bridge. ☐ The bridge created a tricky design problem because it had to cross an electrified line and railroad terminal yard. At first shorter spans utilizing a center pier were considered but then abandoned as too costly since relocation of tracks and control devices in an automatically controlled yard would have been required. ☐ Three types of bridge structures were then considered: a through-truss, a plate girder and box-girder. A through-truss would have required a main span of 440 feet. A plate girder design using 4 girders would have cut the span to 410 feet. The box-girder design was selected because it reduced the length of the span to less than 380 feet. The bridge consists



of three continuous box-girder spans of 151′6″, 378′9″ and 151′6″, and carries two 53′ four-lane roadways. ☐ The bridge also created fabrication, transportation and construction problems because mammoth individual sections had to be handled, and because main line rail traffic could not be interrupted. But the job was completed on schedule, without stopping a train. Just another case where steel provided a practical and economical solution to a difficult design and construction problem. ☐ For more information on our services, write, or call our sales office near you.

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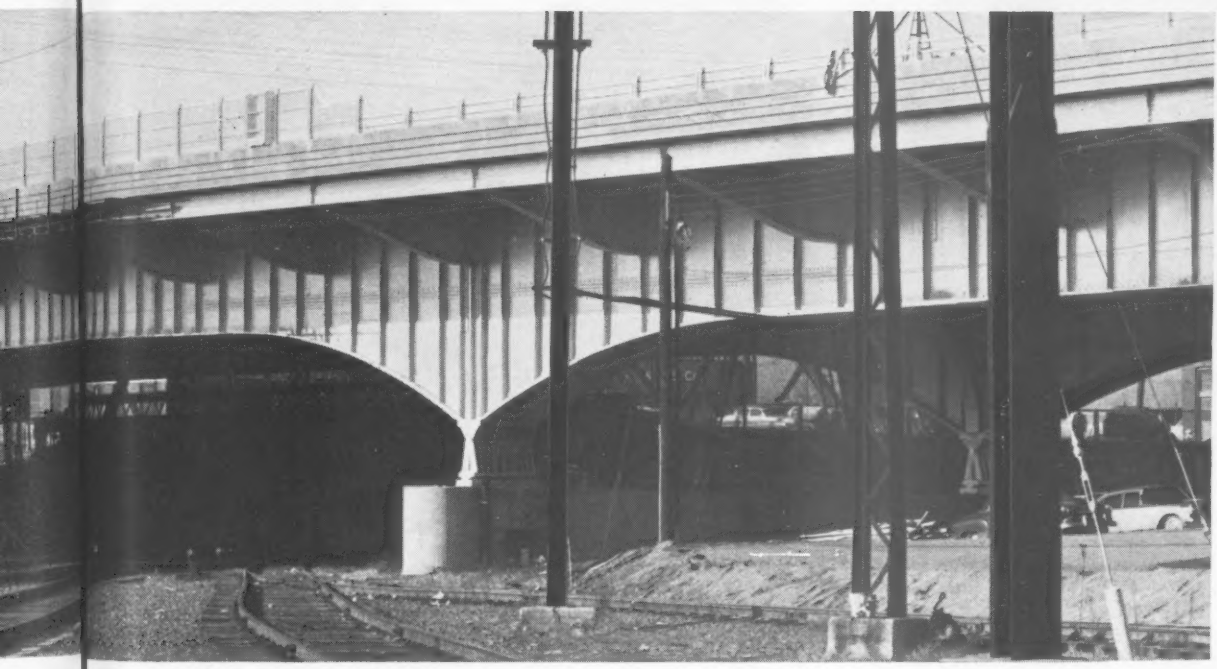

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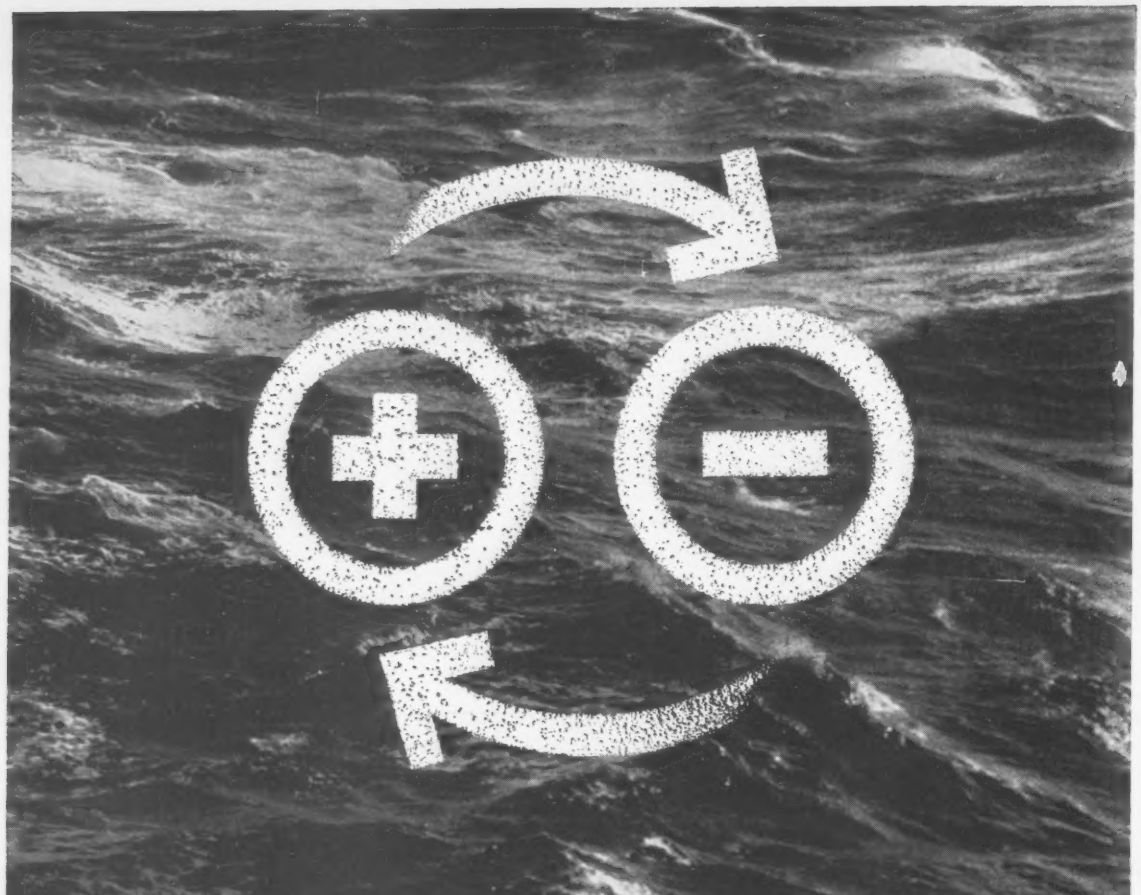

SALT WATER CORROSION

How Lukens *Application Research* can help you find the right steel plate for the job

Among other materials, our Application Engineering staff has studied the outstanding nickel alloy, Monel, in a variety of salt water applications. Monel is surprisingly economical when used in clad plate form—a Lukens specialty produced by bonding a layer of Monel to a tough, low-cost carbon steel backing plate.

The massive legs of off-shore radar platforms, for example, are protected by Lukens Monel-clad steel plate. Our engineers recommended this shielding for the critical splash areas extending above and below the water line. It has proved a most successful application.

Salt water swimming pools on ocean liners, traditionally of tile, often require extensive repair between voyages. We helped solve this problem for a well-known steamship line—again with Monel-clad steel plate. Beautiful to look at, these sea-going pools need only routine cleaning and maintenance. Many are now in service—others are being built, including one for the nuclear powered *Savannah*.

If your assignment is salt water corrosion, let it be our assignment, too. Lukens Application Engineers have documented cases covering a wide range of materials selection problems—to help you choose the right steel plate.

Contact Manager, Application Engineering, C-10 Services Building, Lukens Steel Company, Coatesville, Pa.

ASK FOR THE BULLETIN ON LUKENS CLAD STEELS

Helping Industry Choose Steels That Fit The Job

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A. F. Johnson and Walter Scott get awards as . . .

Beavers Honor Six Members

The Beavers, West Coast organization of construction men, presented Golden Beaver awards to six members at its annual dinner in Los Angeles last week.

Algot F. Johnson, founder and chairman of the Al Johnson Construction Co., and Walter Scott, vice president of Peter Kiewit Sons Co., received the awards for construction management.

Mr. Johnson, one of the organizers of the Johnson, Drake and Piper Co., formed his own company in 1927. He specializes in engineering structures and dredging work.

Mr. Scott, the son of a Nebraska contractor, joined Kiewit in 1926, three years after he graduated from the University of Nebraska School of Engineering. He worked as an engineer, estimator and construction superintendent, rising to the vice presidency.

He has been associated with such Kiewit projects as the Friant-Kern Canal in California, the Portland sewage tunnels, the Eklutna Tunnel in Alaska and Hyperion Outfall, Los Angeles.

Other Beaver members honored are: Victor G. Hindmarsh, senior vice president of the Bechtel Corp., for construction supervision; W. J. Leen, chief of the construction division of the Los Angeles District of the Corps of Engineers, for construction engineering; Tim J. Riley, of the Ingersoll Rand Co., for construction supply; Lt. Gen. Raymond A. Wheeler, U. S. Army Ret., for his military and engineering work.

Air Force Shifts Engineers

Fifteen top Air Force Civil Engineers have been moved to new positions:

Col. James E. Altman, from headquarters Pacific Air Forces Hickam Air Force Base, Hawaii, to Hq Strategic Air Command Offutt, AFB, Nebraska, as Chief of the Base Development Division.

Col. Virgil B. Culberson, from Hq SAC to Hq U. S. Air Forces in Europe as Director of Facility Programs.

Col. Alpheus M. Davis, from Hq Ballistic Missile Test Center, Patrick Air Force Base, Florida, to Hq USAFE as Chief of Installations Management Division.

Col. James A. Dusenbury, from Hq USAFE to the Air Force Regional Civil Engineer Office, New York City.

Col. Archie S. Mayes, from Goose Bay Air Base, Labrador, where he was commander, to Hq 8th Air Force, Westover Air Force Base, Massachusetts, as Assistant Chief of Staff for Civil Engineering.

Col. Elgin W. Scott, Jr., from Allied Air Forces Northern Europe (Norway) to Hq USAFE as Director of Facilities Support.

Col. Paul K. Walker, from Hq 8th Air Force, Westover AFB, to Hq Pacific Air Forces, as Director of Engineering Programs.

Moving from the Directorate of Civil Engineering at Air Force Headquarters to field positions are:

Col. Wayne D. Dunn to Hq Air Training Command, Randolph Air Force Base, Texas, as Assistant Deputy Chief of Staff for Civil Engineering.

Col. Colie Houck, to Hq Ballistic Missile Test Center, Patrick AFB, Florida, as Chief, Installation Engineer Division.

Col. Edgar R. Jackson, Jr., to Hq Air Research and Development Command, Washington, D. C. as Assistant Director of Civil Engineering.

Col. Kenneth J. Payne to the Industrial College of the Armed Forces.

Col. Roscoe G. Rector to Hq Air Defense Command, Ent Air Force Base, as Director of Construction, Civil Engineering.

Assigned to the Directorate of Civil Engineering, USAF in Washington are:

Col. Edward J. Fletcher from Hq USAFE to Assistant Deputy Director for Facilities Support.

Col. Gregory J. Skinner, from the Air Force Regional Civil Engineer office in New York City, to Chief, Strategic Branch, Deputy Directorate for Construction.

Col. Henry J. Stehling from the War College to Deputy Chief, Programs Division, Deputy Directorate for Real Property.

Stone & Webster Names New Chairman, President

T. Cortlandt Williams is the newly elected chairman of the board for Stone & Webster Engineering Corp. He has been president since 1955.

Fred W. Argue, who has been executive vice president, succeeds Mr. Williams as president.

A native of Vineland, N. J., Mr. Williams joined Stone & Webster in 1923 after graduation from Bucknell University as a mechanical engineer. During his 27 years with the company he has directed many construction projects, including the atomic energy installations at Oak Ridge, Tenn.

Mr. Argue came to the company in 1941 as a power engineer. He was elected executive vice president in 1959. He has also served as engineering manager for five years. From 1921 to 1941 he was involved in utilities work and engineering education.

Ralph A. Morgen Directs Rose Polytechnic Institute

Ralph A. Morgen takes over as president of Rose Polytechnic Institute.

Since 1954, Mr. Morgen has been with Purdue University, first as research director of the Purdue Research Foundation and later as assistant to the president for university research.

A graduate of the University of California, Mr. Morgen has taught chemical engineering at the University of Florida. He has also served as program director for engineering for the National Science Foundation in Washington.

Suburban Excavators of Wakefield, Massachusetts use a 4-yard bucket on 100′ of boom in relocating streams on Interstate Highway project near Bernardston, Massachusetts. On a later project it handled well over 100,000 yards of peat in 22 working days. The Marion 111-M is available in bucket sizes from 1¾ to 5 yards, and with boom lengths from 80′ to 110′.

To help keep job profits up...

TODAY'S CONTRACTOR SELECTS TOMORROW'S MACHINE— THE MARION 111-M

Peak production on a day-after-day basis . . . peak production that can only come from a mobile, fast-cycle, low-maintenance excavator. This is what the modern contractor needs to offset increasing competition and resulting "tight" job bidding. That's why more and more contractors are turning to today's Marion 111-M, for it's a machine that delivers what its size promises. Here are some of the reasons why:

1. The MARION 111-M can be **easily and quickly converted** from one front end to another—on the job site.
2. The MARION 111-M utilizes **Ward-Leonard electric control** for swinging which, in company with the machine's inherently excellent balance, helps cut cycle time—increase production—reduce maintenance.
3. The MARION 111-M employs famous

Marionair control for all machine functions other than swinging — providing operators with instant, sure machine response at the touch of a lever, as well as low-maintenance service, and greatly reduced operator fatigue.

4. The MARION 111-M offers a machine size that **balances with modern haulage units** of higher capacity.
5. The MARION 111-M offers **big capacity** at maximum radius as a dragline or clamshell.

The Marion 111-M is a big capacity machine that has dramatically proved its ability throughout the world under the most difficult conditions. It incorporates field-proved performance features that produce big output at low cost. Get full details from your nearest Marion distributor or sales representative — now!

You get **MORE** *with* **MARION**

MARION POWER SHOVEL COMPANY,
MARION, OHIO
A Division of Universal Marion Corporation

The same Marion, equipped with a 4½-yard dipper, is shown ripping ledge during subfreezing weather on the new north-south Interstate Highway venture in Massachusetts.

P.S. To Bridge Builders . . .

MARION machines are piling up impressive work records on bridge work from coast to coast. Both the 21-ton 35-M crane and the 27-ton 43-M crane offer crawler-mounted performance benefits that stand out, either on the structure or down in the river bottom. Digging footers, driving piling, setting forms or steel and in pouring concrete, these machines give owners 13 BIG bridge-builder benefits. They are big work producers as standard machines—with optional equipment you can get every performance feature you've ever wanted. Let your MARION Distributor show you how.

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JOB
let Griffin
analyze your ground
water problem and
estimate costs

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Flood Control Projects Are Under Estimate

Two flood control projects will cost the Pennsylvania department of forests and waters, $192,198. C. H. McConnell is chief of the division of flood control, Harrisburg.

The first project—a 545 ft bypass channel on Old Dam Creek, Dickson City, Pa.—includes construction of a drop structure, installation of a 30-in. gated drainage structure, and closing of the breach in the existing levee. The award, at $6,422 to Siniawa Construction Co., Scranton, Pa., is 30% below the engineer's estimate.

The second—a flood protection on Glade Run in Warren—includes construction of a 28-ft-wide, 681-ft-rectangular reinforced concrete channel, 93 lin ft of floodwall, 3,303 ft of earth levees and miscellaneous drainage structures, and slope protection. The award on this job went to Thomas A. Mekis, Valencia, Pa., at $185,776. It was 22.8% under the engineer's estimate. Stream flow will be diverted, and multiple oil lines must be removed prior to the construction of the earth levee.

On both contracts, concrete must attain a compressive strength of 3,000 psi.

Minimum wages on the Old Creek job include: foreman carpenter $3.05; crane, shovel & dragline operators, $3.985; common laborers, $1.90.

Minimum wages for 1959 on the Warren job include: carpenter, $3.27; power crane & shovel and dragline operators, $3.66; common laborer, $2.355. In 1960 these rates will be increased to $3.40, $3.85 and $2.48, respectively.

The bidding on these two jobs went like this:

Old Dam Creek Project

1C Siniawa Constr. Co., Scranton	$6,422
2 Wellington Jackson & Edw Chorba, Dickson City, Pa	$8,478
5 Gillen Constr. Co., Carbondale, Pa	18,548
EE Dept. of Forests & Waters, Division of Flood Control, Harrisburg	9,179

Bids: 10-14-59 Items	Unit	Quantity	Unit Prices 1C	2
Excavation, common	cy	5,450	$0.48	$0.95
structural	cy	85	1.50	2.25
Embankment, rolled	cy	400	0.90	0.75
Backfill, compacted	cy	45	2.50	2.25
Seeding	ac	0.5	800.00	600.00
Dumped riprap, 12" thick	cy	80	7.00	6.50
Concrete, cl A	cy	15	70.00	65.00
Steel reinforcement	lb	1,500	0.28	0.16
Cor met pipe, 30" dia	lf	55	10.00	8.50
Seepage diaphragm, 30" dia	ea	1	125.00	100.00
Flapgate, 30" dia	ea	1	155.00	150.00
End section, 30" dia	ea	1	80.00	70.00
Gravel drain	cy	6	6.00	2.50

Completion schedule: 90 cal days.
Liquidated damages: $25/day.

Warren Project

1C Thomas A. Mekis, Valencia, Pa	$185,776
2 Keystone Constr. Co., Meadville, Pa	225,180
9 Ryan Bros., Inc., Clearfield, Pa	266,930
EE Dept. of Forests & Waters, Division of Flood Control, Harrisburg	240,682

Bids: 10-14-59 Items	Unit	Quantity	Unit Prices 1C	2
Diversn & c/o stream	ls	job	$2,500	$10,000
Clear & grub	ls	job	3,000	8,600
Stripping	cy	3,900	0.60	1.25
Excavation, common	cy	6,100	0.60	0.95
structural	cy	2,150	3.50	4.00
borrow	cy	27,000	0.65	0.95
Embankment, rolled	cy	19,500	0.35	0.50
additional rolling	hr	50	18.00	10.00
Backfill, compacted	cy	740	2.50	2.50
Conc & msnry struct. remov	cy	220	7.50	10.00
Seeding	ac	2.5	700.00	700.00
Dumped riprap, 15" thick	sy	5,650	3.20	2.80
18" thick	sy	90	4.25	3.00
Dumped rock	cy	200	6.00	3.50
Concrete, class A, walls	cy	590	55.00	68.50
slabs & footings	cy	940	38.00	40.02
Reinforcement bars	lb	270,000	0.14	0.150
Cor met pipe, 24" dia	lf	130	8.00	10.00
18" dia	lf	9	6.00	9.00
12" dia	lf	7	5.00	6.50
End sections, 24" dia	ea	5	80.00	50.00
18" dia	ea	1	50.00	37.50
Seepage diaphragms, 24" dia	ea	5	150.00	120.00
18" dia	ea	1	110.00	87.50
Flap gate, 24" dia	ea	5	150.00	144.00
21" dia	ea	1	140.00	134.00
18" dia	ea	2	120.00	114.00
12" dia	ea	5	80.00	54.00
6" dia	ea	3	50.00	40.00
Gravel drain	cy	490	7.50	5.20
Weep holes	ea	76	2.25	3.00
Vit clay drain pipe, perf, 6"	lf	580	1.00	1.00
Drill & grt in existing conc	lf	29	4.00	12.00
Miscellaneous metals	lb	500	0.50	1.00
Sand bag storage shed	ea	1	1,000	1,050
Cor met catch basin	ea	1	300.00	225.00
Rubber waterstop	lf	33	4.00	4.00
Project sign erect	ea	1	100.00	100.00
Ramp barricades	ea	3	50.00	60.00

Completion schedule: 450 cal. days. Liq. dam. $60/day.

Shoal Dredging Award Tops Estimate by 25%

Approximately 1,728,000 cu yd of material will be dredged from the Round Island Shoals in the St. Mary's River, Michigan and Ontario, to provide usable channels for deep draft navigation.

Of this amount, approximately 1,300,000 cu yd will be removed to a minimum swept depth of 30 ft below low water datum. The material consists chiefly of well-compacted sand, clay and gravel, involving thin cuts over the scattered shoals.

The Detroit Corps of Engineers award at $6,464,940, to Great Lakes Dredge & Dock Co., topped the engineer's estimate by 25%. It was 21% under the only other complete bid, which topped the estimate by a whopping 57%.

Minimum wages range from a high of $3.25 for skilled, through $2.80 for semi-skilled, to a low of $2.50 for common laborers.

The bids went like this:

1C Great Lakes Dredge & Dock Co.	$6,464,940
2 Al Johnson Constr. Co., Minneapolis	8,177,040
EE Corps of Engineers, Detroit, Mich.	8,187,420

Bids: 9-23-59 Items	Unit	Quantity	Unit Prices 1C	2
Dredging Section 1	cy	834,000	$5.64	$6.16
Section 2	cy	894,000	1.97	3.40

Commence: 10-2-59. Complete: 8-1-62
Liquidated damages: $500/day

Materials Prices

Monthly Market Quotations by ENR Field Reporters

LUMBER, TIMBER, PLYWOOD PER M FT.B.M., CARLOAD LOTS F.O.B.

SOUTHERN PINE AND DOUGLAS FIR

All Southern Pine is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)
All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1. Lengths up to 20 ft. (Prices in italics)

	1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh
Atlanta.....n†	**$92.00**	**$95.00**	**$90.00**	**$95.00**	**$95.00**	**$100.00**	**$130.00**	.....	.....
Baltimore.....o	**100.00**	**100.00**	**105.00**	**105.00**	**110.00**	**110.00**	**125.00**	.....	.....
	185.00g	*138.00g*	*134.50g*	*137.00g*	*137.00g*	*137.00g*	*152.00g*	*$180.00*	*$170.00*
Birmingham....n†r	**83.00**	**85.00**	**82.00**	**84.00**	**89.00**	**95.00**	**111.00**	.....	.....
	80.00	*80.00*	*85.00*	*81.00*	*81.00*	*98.00*	*88.00*	*85.00*	*88.00*
Boston.....ns	**105.00***f*	**105.00***f*	**108.00***f*	**108.00***f*	**108.00***f*	**124.00***a*	.....	.....	.....
	111.00	*108.00*	*120.00*	*120.00*	*122.00*	*126.00*	*150.00*	*163.00*	*169.00*
Chicago.....**	**120.00**	**123.00**	**117.00**	**131.00**	**139.00**	**140.00**	**135.00**	.....	.....
	126.00	*126.00*	*139.00*	*137.00*	*137.00*	*138.00*	*146.00*	*146.00*	*146.00*
Cincinnati.....n*	**102.50**	**103.75**	**96.50**	**98.00**	**104.75**	**112.75**	**121.00**	.....	.....
	110.00	*113.00*	*110.00*	*112.00*	*113.75*	*129.50*	*145.25*	*145.25*	*145.25*
Cleveland.....o**	**100.00**	**102.00**	**102.00**	**100.00**	**104.00**	**110.00**	.....	.....	.....
	.....	.....	*115.00*	*112.00*	*112.00*	*116.00*	*140.00*	*140.00*	*140.00*
Dallas.....‡	**76.00***k*	**85.00***k*	**80.00***k*	**80.00***k*	**78.00***k*	**78.00***k*	**125.00**	.....	.....
Denver.....n*	*Not in stock*		*119.50*	*120.50*	*119.50*	*122.00*	*140.00*	*162.50*	*170.00*
Detroit.....‡	**138.00**	**140.50**	**138.00**	**136.00**	**143.50**	**143.50**	.....	.....	.....
	139.25	*139.25*	*150.25*	*148.50*	*157.00*	*162.00*	*201.00*	*218.00*	*218.00*
Kansas City....tn	**120.00**	**120.00**	**130.00**	**132.50**	**135.00**	**150.00**	.....	.....	.....
	120.00	*120.00*	*130.00*	*132.50*	*135.00*	*140.00*	*165.00*	*225.00*	*225.00*
Los Angeles....znu	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*136.00*	*145.00*	*145.00*
Minneapolis....os	*145.00*	*145.00*	*145.00*	*145.00*	*145.00*	*145.00*	*185.00*	*185.00*	*185.00*
Montreal.....*bp	**84.00***a*	**90.00***a*	**84.00***a*	**84.00***a*	**99.00***a*	**125.00***a*	.....	.....	.....
	160.00	*160.00*	*160.00*	*160.00*	*160.00*	*160.00*	*170.00*	*170.00*	*170.00*
New Orleans...†n	**89.00**	**89.00**	**96.00**	**95.00**	**95.00**	**98.00**	**128.00**	.....	.....
	115.50	*115.50*	*115.50*	*115.50*	*115.50*	*116.50*	*122.50*	*125.50*	*125.50*
New York.....t	**117.00**	**119.00**	**129.00**	**129.00**	**129.00**	**131.00**	**250.00**	.....	.....
	.....	.....	*129.00*	*130.00*	*130.00*	*132.00*	*169.00*	*174.00*	*174.00*
Philadelphia....nt	**110.00**	**110.00**	**110.00**	**110.00**	**110.00**	**110.00**	**135.00**	.....	.....
	.....	.....	*130.00*	*130.00*	*130.00*	*130.00*	*200.00*	*200.00*	.....
Pittsburgh.....st	**135.00**	**135.00**	**135.00**	**135.00**	**140.00**	**140.00**	**165.00**	.....	.....
	135.00	*115.00*	*140.00m*	*150.00*	*150.00*	*150.00*	*225.00*	*225.00*	*225.00*
St. Louis.....lnt	**121.00**	**123.00**	**131.00***d*	**131.00***d*	**131.00***e*	**133.00***e*	.....	.....	.....
	160.00	*160.00*	*140.00e*	*140.00e*	*140.00e*	*140.00e*	*197.00e*	*197.00e*	*197.00*
San Francisco..nz	*90.00*	*90.00*	*92.00*	*92.00*	*92.00*	*92.00*	*109.00*	*131.00*	*133.00*
Seattle.....n†	*65.00*	*72.00*	*75.00*	*75.00*	*75.00*	*76.00*	*90.00*	*90.00*	*95.00*
Toronto.....*	**86.00***a*	**88.00***a*	**95.00***a*	**85.00***a*	**88.00**	**87.00***a*	**87.00***a*	.....	.....
	95.00	*97.00*	*118.00*	*120.00*	*125.00*	*125.00*	*135.00*	*145.00*	*150.00*

	LONG LEAF Y. P. Merchantable grade up to 20 ft.		FIR PLYWOOD ⅜" Interior plyscored, C-D gr.	FIR PLYWOOD ¾" Ply-form grade*
	2x12 Rgh	12x12 Rgh		
Atlanta.....n†	**$140.00**	**$160.00**	**$135.00**	**$270.00**
Baltimore.....o	**175.00**	**190.00**	**175.00**	**275.00**
Birmingham....n†r	**116.00**	**168.00**	**126.30**	**214.50**
Boston.....ns	.....	.....	**165.00***c*	**285.00***c*
Chicago.....**	**163.00**	**163.00**	**146.00**	**244.00**
Cincinnati.....n*	**138.00**	**125.00**	**98.00***f*	**180.00***f*
Cleveland.....o**	.....	.....	**129.00***a*	**220.00**
Dallas.....‡	**133.00**	**160.00**	**112.50***ac*	**200.00***ac*
Denver.....n*	.....	.....	**148.50**	**240.50**
Detroit.....‡	**151.50**	.....	**175.00***gc*	**265.00***gc*
Kansas City....tn	.....	.....	**150.00**	**215.00**
Los Angeles....znu	.....	.....	**128.00**	**240.00**
Minneapolis....os	.....	.....	**200.00**	**320.00**
Montreal.....*bp	**120.00**	**120.00**	**119.25**	**225.95**
New Orleans...†n	**160.00**	**155.00**	**116.25**	**215.00**
New York.....t	**250.00**	**250.00**	**123.20***a*	**207.60***a*
Philadelphia....nt	.....	.....	**150.00***h*	**280.00***h*
Pittsburgh.....st	**145.00**	**165.00**	**235.00**	**295.00**
St. Louis.....lnt	.....	.....	**174.28***achj*	**272.07***ach*
San Francisco..nz	**98.00***h*	**180.00***h*		
Seattle.....n†	**110.00***aeg*	**205.00***aeg*		
Toronto.....*	**256.00**	**305.50**		

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL.

LUMBER: Bold Face Type, Southern Pine. Italics, Douglas Fir. *a Spruce. *b Federal tax exempt, add 6% mun. & prov. tax. *c 5M lots. *d 8, 10, & 12 ft. lengths. *e 8 to 16 ft. lengths. *f Hemlock *g No. 1 common. *j 8 ft. lengths. *k No. 3 common. *l Add 2% sales tax. *n Less 2% disc. 10 days. *o Less 2% disc. 10th. *p Less 1% disc. 10 days. *q fir: $80.25 in truck lots, fob job or CL, f.o.b. city. *r For f.o.b. city price add $8 for pine, $38 for fir eff. 1/1/58. *s asd trucklots. *t trucklots del. *u Retail LCL yard. *v Retail LCL, del. *w add 6% mun. & Prov. tax. *x add 4% sales tax.

* PLYWOOD (Plyform, oiled and edge sealed): Douglas fir, 4' x 8' panels, 5-ply sanded 2 sides, carload lots, delivered per 1000 sq. ft. surface. Seattle base price. Interior, moisture resistant, ⅜", $151.00; ¾", $171.00 Exterior, waterproof, ⅜", $155.00; ¾", $175.00. *a Delivered. *c Truck lots. *d A-C exterior. *e LCL. *f less 1%, 5 days. *g less 2% for cash. *h less 2% disc, 10 days. *j add 2% sales tax.

GLASS, EXPLOSIVES, CHEMICALS, PILES, TIES

WINDOW GLASS

Discounts from jobbers list, Feb. 1, 1950*a*

	Single or Double Strength A quality	Single or Double Strength B quality
Atlanta	78%	80%*g*
Baltimore	74%*d*	74%*d*
Birmingham	82%*f*	82%*f*
Boston	72+10%*p*	72+10%*p*
Chicago	72%	72%
Cincinnati	74%	74%
Cleveland	74-2-10%	74-2-10%
Dallas	76%	76%
Denver	73.5%	73.5%
Detroit	74-10-10%	74-10-10%
Kansas City	76-10-10%	76-10-10%
Los Angeles	$12.88/17.32*h*	$10.45/14.13*h*
Minneapolis	71-10%	71-10%
Montreal	40-10-5%*b*	40-10-5%*b*
New Orleans	76%*g*	76%*g*
New York	79%*l*	79%*l*
Philadelphia	78%*g*	80%*g*
Pittsburgh	72%	73%
St. Louis	72-10-10%*mo*	72-10-10%*mo*
San Francisco	60%	73%
Seattle	$8.85/11.55*hig*	$6.41/8.67*hjp*
Toronto	$6.49/9.57*h*	$5.90/8.70*h*

Price of 80% Ammonia Gelatin in U. S., $1.75 per 100 lbs. higher than 40% in Canada.

Glass: *a Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $80.00 for A quality, $52.75 for B quality. *b sales tax extra. *c 77% for single strength. *d From 6/15/52 list. *e 77% for double strength. *f Single strength; double strength, 83%. *g From 8/1/58 list. *n ss/ds, 40-in. *l 20 boxes min. *j CL quantity. *k eff. 12/58. *l eff. 10/15/58. *m less 2% disc, 10 days. *n less 1% disc, 10 days. *o add 2% sales tax. *p less 1% for cash. *q less 2% for cash

Explosives: Cartridges of 1¼" diameter or over, in standard lengths. *g deliveries in certain areas must be by truck or by truck and boat, requiring extra charge. *h F.o.b. Beloeil (near Montreal), per 100 lb., lots under 2000*k*, wood cases, forcite, 40%. Forcite 60%, $23.60 in fiber cases: forcite 40%, $23.20; forcite 60%, $24.95.

40% Ammonia Gelatin price ranges in other than urban areas, per lb: (except Seismograph Grades)

	C/L 300,000 lb. lots	10,000 lb. lots	2,000 lb. lots	200 lb. lots
Group 1*	$0.2095	$0.2195	$0.2545	$0.2695
Group 2†	.2170	.2270	.2620	.2770

* All areas except those in Group 2 and N.J. cities of Bayone, Hoboken, Jersey City, No. Bergen, Union City and Weehawken † Florida counties of Manatee, Hardee, Highlands, Okeechobee, St. Lucieand south thereof; Idaho; Maine; Montana; New Mexico counties of Catron, Socorro, Lincoln, De Baca, Roosevelt and south thereof; Texas counties of Bailey, Lamb, Hale, Floyd, Motley, Cottle, Hardeman, Foard, Knox, Haskell, Jones, Taylor, Coleman, McCulloch, San Saba, Burnet, Williamson, Milan, Robertson, Leon, Houston, Angelina, Nacogdoches, Shelby and south thereof.

EXPLOSIVES

Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 500 lb. lots

PILES

Prices per linear foot, fir and pine, rough peeled, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine under fifty feet based on freight from mid-South, over fifty feet, on freight from deep South.

Dimensions	Points	Length	By Rail Pine*§ R	By Rail Fir R
12" at butt	6-in.	30 to 39-ft.	$0.32*a*	....
12"—2-ft. from butt	6-in.	40 to 44-ft.	.69	....
12"—2-ft. from butt	6-in.	45 to 49-ft.	.73	....
12"—2-ft. from butt	6-in.	50 to 54-ft.	.77	....
12"—2-ft. from butt	6-in.	55 to 59-ft.	.81	....
14"—2-ft. from butt	6-in.	60 to 64-ft.	.87	....
14"—2-ft. from butt	6-in.	65 to 69-ft.	.92	....
14"—2-ft. from butt	6-in.	70 to 74-ft.	1.02	1.07
14"—2-ft. from butt	6-in.	75 to 79-ft.	1.07	1.07
14"—2-ft. from butt	5-in.	80 to 84-ft.	1.17	1.10
14"—2-ft. from butt	5-in.	85 to 89-ft.	1.27	1.15/1.20

* Pine piling over 90 feet available only in limited quantities. § ASTM Class B
• a, trucked in from N. J.

RAILWAY TIES

Prices f.o.b. per tie box carload lots:

		6" x 8" x 8' Untr.	6" x 8" x 8' Tr.	7" x 8" x 8'6" Untr.	7" x 8" x 8'6" Tr.
Birmingham*...	Hardwood, Grade 3	$1.70	$2.55	Gr. 5 $2.25	$3.33
	Grade 2	1.50	2.35	" 4 2.10	3.18
	Grade 1	1.15	2.00	" 3a 1.70	2.78
Chicago	Red Oak	....	4.00*a*	....	4.50*a*
New York	S. L. Sap Pine	2.50	4.00	3.00	5.00
	Mixed Oak	2.50	4.00	3.00	5.00
Philadelphia	Mixed Oak	2.38	3.97	2.78	4.57
St. Louis	Mixed Oak	2.65	3.10*a*	3.10*h*	3.75*ah*
San Francisco	Douglas Fir	2.66*ef*	3.73*ef*	3.52*ef*	4.90*ca*

Tr.—Treated; Untr.—Untreated. *a*Creosoted. *c* Empty cell. *e* Green f.o.b. cars. *g* 7 x 9 x 8'6" * Add 75¢/tie freight charge to Birmingham. *h 7" x 9" x 9½"

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb.	$5.02
Chlorine cylinders, liquid, per lb. f.o.b. works	.11
Calcium chloride, 77-80%, flaked, 100-lb. paper bag, f.o.b. works, ton	31.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb.	2.65
Soda ash, 58%, in paper bags, per 100 lb. dense	1.90
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	2.05
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	21.20

See following ENR issues for OTHER PRICES:

- Wage Rates, Building Board, Lath, Insulation: Last, Jan. 7; Next Jan. 28.
- Cement Aggregates, Ready-mixed Concrete, Asphalt: Last, Jan. 7; Next, Feb. 4.
- Iron & Steel Products. Pipe: Last, Jan. 14. Next, Feb. 11.
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Dec. 24; Next Jan. 28.

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, MARIE MORAVSIK, ELAINE CHOMYAK, ELIZABETH WERRA, ELEANOR QUERET, Reports, J. H. WEBBER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
January 27 Maine

HEAVY CONSTRUCTION—LB & CA

▲ **CONNECTICUT**—State Hy. Comr., 170 Douglas St., Hartford. Bids opened 1/11.

Brunalli Constr. Co. Inc., 109 Summer St., Southington, Conn., LB $3,350,778, (14 bidders), 21,692 lin. ft. relocation Rte. U.S. 6, incl. 5 bridges and 1 box culvert, Fed. Aid Proj. EI-84-2 (15) (35) Project No. 182-07, Cheshire and Waterbury. CD 12/23.

▲ **Savin Bros., Inc.,** 522 Cottage Grove Rd., Bloomfield, Conn., CA $2,400,000, 1.4 million cu. yd. fill, etc., Long Wharf Redevelopment, NEW HAVEN, CONN. City, City Hall, New Haven, Conn. Bids Dec. 8. CD 12/10, under LB.

BUILDINGS—LB & CA

▲ **Vappi & Co., Inc.,** 240 Sidney St., Cambridge, Mass., CA Approx. $3,100,000, DISTRIBUTION CENTER, NEEDHAM, MASS. Developer Pond View Industrial Park, Rte. 128, c/o R. M. Bradley & Co., 250 Boylston St., Boston, Mass. Polaroid Corp., 730 Main St., Cambridge, Mass., lessee. CD 2/6, under Vappi Development Co., Inc., as owner.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
February 3 New Jersey — February 4 New York
February 4 New York & Pennsylvania
STREETS AND ROADS
January 26 Maryland — February 4 New York

▲ **Md., Baltimore**—BA 1/27—City, Baltimore Expressway Div., Bureau Hys., 303 Municipal Bldg., Zone 2, 0.407 mi. section Jones Falls Expressway from 0.4 mi. north of North Ave. to point just south of Keswick Rd. incl. interchange at 29th St. Plans deposit $30. Geo. V. Walters, c/o owner, hy. engr. CD 4/22.

▲ **NEW YORK**—BA 2/16—Triborough Bridge & Tunnel Auth., Administration Bldg., Randall's Island, New York, Zone 35, Narrows Bridge Contr. No. NB-3, cables and suspenders. Plans deposit $25. CD 1/20/55.

▲ **NEW YORK**—BA 2/24—Triborough Bridge & Tunnel Auth., Administration Bldg., Randall's Island, New York, Zone 35, Narrows Bridge Contr. No. NB-2B, Brooklyn Tower; Narrows Bridge Contr. No. NB-2S, Staten Island Tower. Plans deposit $25. CD 1/20/55.

BUILDINGS—BA

▲ **New York and New Jersey**—ADMINISTRATION—BA 2/16—Port of New York Authority, Rm. 1100, 111 Eighth Ave., New York, Zone 11, administration bldg. at New Jersey Approach to George Washington Bridge, Fort Lee Boro, N. J., Contr. GWB-190.026. Plans deposit $100. CD 8/14/57, under Bridges.

HEAVY CONSTRUCTION—LB & CA

▲ **J. Rich Steers,** 17 Battery Pl., New York, N. Y., and **Frederick Snare Corp.,** 233 Broadway, New York, N. Y., CA $16,527,975, Brooklyn and Staten Island Tower Piers, Narrows Bridge, Contracts NB-1B and NB-1S, NEW YORK. Triborough Bridge & Tunnel Auth., Administration Bldg., Randall's Island, New York 35, N. Y. Bids Dec. 16. CD 12/18, under LB.

▲ **Corbetta Constr. Co.,** 220 W. 42nd St., New York, N. Y., LB $2,344,000 (9 bidders), Pier 6, bulkhead and deck Brooklyn Port Authority Piers, Contr. BP 190.002, BROOKLYN, N. Y. Port of New York Authority, 111 8th Ave., New York 11, N. Y. Bids Dec. 29. CD 12/28.

▲ **MARYLAND**—State Rds. Comn., 300 W. Preston St., Baltimore, Zone 3,

Regal Constr. Co., Upper Marlboro, Md., CA $2,072,731, grade, drain, pave 8.197 mi. John Hanson Hy. from Palmer Hy. to Kenilworth Interchange, incl. approach roads, three 4-span bridges, near Wash., D. C., P-631-23-24-27-29-320, Prince George Co. Bids Nov. 24. CD 11/29, under LB.

BUILDINGS—LB & CA

▲† **P J. Carlin Constr. Co. & Atlas Tile & Marble Works, Inc.,** 41-17 Crescent St., Long Island City, N. Y., LB $13,543,000 (15 bidders), 7 story, ground floor, bsmnt., COURT HOUSE and 4 story FEDERAL OFFICE BLDG., steel, concrete beams and girders, limestone and granite, rein.-con. fdns., united by common entrance lobby, Washington, Tillery and Adams Sts., Proj. No. 30904, Appro. No. 47x1147, BROOKLYN, N. Y. General Services Admin., P. Bldgs. Service, Region 2, Business Service Center, 250 Hudson St., New York 13, N. Y. Bids Jan. 7. CD 12/28.

▲ **Praver Assocs.,** c/o Samuel Paul, archt., 89-51 164th St., Jamaica, N. Y., Owner Builds, $3,000,000, two 6 story APARTMENTS, 99th St. and 60th Avenue, REGO PARK, N. Y.

▲† **Lasker-Goldman Corp.,** 50 E. 42nd St., New York 17, N. Y., CA $3,980,000, CADET BARRACKS, U. S. Military Academy, FY 1690 Program, Serial No. ENG-30-076-60-46, WEST POINT, N. Y. U. S. Eng., 111 East 16th St., New York 3, N. Y. Bids Dec. 3. CD 12/7, under LB.

▲† **B. J. Lucarelli Co., Inc.,** 1100 McCarter Hy., Newark, N. J., CA $4,676,800, with additives, FAMILY QUARTERS, U.S. Military Academy, Serial No. ENG-30-075-60-35, WEST POINT, N. Y. U.S. Eng., 111 East 16th St., New York 3, N. Y. Bids Jan. 7. CD 1/11, under LB.

▲ **Green Tree Development Corp.,** 1195 Haverford Rd., Crum Lynne, Pa., Separate Contracts, $2,500,000, 300-unit, 15 APARTMENTS, Chester Pike, GLENOLDEN, PA. Ballino & Ruoff, 216 Long Lane, Upper Darby, Pa., archts.

▲ **Aberthau Constr. Co.,** 60 State St., Boston, Mass., CA $6,000,000, TECHNICAL CENTER, 50 acre site, KING OF PRUSSIA, PA. Pennsalt Chemical Corp., 3 Penn Center Place, Phila., Pa. Cabot, Cabot & Forbes Assocs., 60 State St., Boston, Mass., archts. CD 1/6.

▲ **Crump, Inc.,** 4031 Bigelow Blvd., Pittsburgh, Pa., **Psaty & Fuhrman, Inc.,** 369 Lexington Ave., New York, N. Y., and **C. E. Youngdall & Co., Inc.,** 2928 41 Ave., Long Island City, N. Y., CA $10,719,000, general contract North View Heights HOUSING, PITTSBURGH, PA., Pittsburgh Housing Auth., 200 Ross St., Pittsburgh, Pa. Grand total $13,688,681, CD 9/19/56;
Crouse Wyane, Inc., 3370 Stafford St., Pittsburgh, Pa., CA $1,655,505, plumbing for housing (Pittsburgh, Pa.);
Coleman-Good, Inc., 941 Behan St., Pittsburgh, Pa., CA $698,000, heating for housing, (Pittsburgh, Pa.);
Devlin Electric Constr. Co., Bessemer Bldg., Pittsburgh, Pa., CA $616,176, electrical work for housing, (Pittsburgh, Pa.).

▲ **West Gate Farms,** 206 E. Ayer St., Newport, Pa., Separate Contracts, $2,000,000, RESIDENTIAL DEVELOPMENT (135), Newport Gap Pike, NEWPORT, DEL.

▲ **Henry A. Knott, Inc.,** 2406 Greenmount Ave., Baltimore 18, Md., CA $2,115,112, brick, concrete, steel block Loch Raven JUNIOR HIGH SCHOOL, north of Baltimore, TOWSON MD. Baltimore Co. Bd. Educ., Aigburth Rd., Towson 4, Md. Bids Dec. 29. CD 1/5, under LB.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; Industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED
New England — Middle West
Middle Atlantic — West of Mississippi
South — Far West

PROPOSED WORK
Water Supply — Public Buildings
Sewers, Waste Disposal — Mass Housing
Bridges — Commercial Buildings
Streets & Roads — Industrial Buildings
Earthwork, Waterways — Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily
For additional reports see Construction Daily.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 29 Kentucky — February 3 Virginia
February 24 Louisiana
STREETS AND ROADS
January 27 Louisiana — January 29 Kentucky
February 3 Virginia

▲† **Fla., Panama City**—FIELD MAINTENANCE HANGARS—BA 2/17—U. S. Eng., P. O. Box 1169, Mobile, Ala., field maintenance hangars with parachute and dinghy shop, Tyndall Air Force Base, ENG-01-076-60-33B. $2,000,000. Plans deposit $8.50. CD 1/8.

HEAVY CONSTRUCTION—LB & CA

▲† **Western Contg. Co.,** 400 Benson Bldg., Sioux City, Iowa, CA $10,468,000, utility systems, taxiways and jet parking apron, Dulles International Airport, CHANTILLY, VA. Federal Aviation Agency, 16 and Constitution Ave. N.W., Wash. 25, D. C. Bids Dec. 17. CD 12/21, under LB.

▲ **FLORIDA**—State Rd. Dpt., Holland Bldg., Tallahassee,

Troup Bros., Inc., Box 33168, Miami 33, Fla., CA $2,286,079, 4-lane dual roadway limerock base Type 1 b. conc. surf. course with binder course, 3 dual and 3 single concrete bridges, 2.834 mi. SR 826 (Palmetto Rd.) State Proj. Job No. 87260-3104, Dade Co. Bids Dec. 15, awarded Jan. 7. CD 12/18, under LB.

BUILDINGS—LB & CA

▲ **F. W. Owens Co.,** 119 N. 5th St., Louisville 2, Ky., CA $2,122,740, HOSPITAL addns., to incl. 2 more floors, 3-story extension of West Wing, LOUISVILLE, KY. Jewish Hospital, 217 E. Crestnut St., Louisville, Ky. Bids Dec. 30, CD 1/4, under LB;
Standard Engineering Co., 317 Wallace Ave., Louisville 7, Ky., CA $529,000, plumbing and heating for hospital addn. (Louisville, Ky.). CD 1/7, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
February 16 Ohio

▲† **Michigan and Ontario**—BA After 1/15—U. S. Eng., P.O. Box 1027, Detroit 31, Mich., dredging from Port Huron to Stag Island in St. Clair River, Ontario, from Port Huron to Stag Island, approx. 55 mi. northeast of Detroit, Mich., CIVENG-20-064-60-37. $2,000,000. CD 9/29.

▲† **Michigan and Ontario**—BA After 1/15—U. S. Eng., P.O. Box 1027, Detroit 31, Mich., dredging in Southeast Bend Cut-Off Channel, St. Clair River, Ontario, approx. 30 mi. northeast of Detroit, Mich., CIVENG-20-064-60-36. $9,000,000. CD 9/29.

▲ **ILLINOIS**—BA 2/11—Illinois State Toll Highway Comn., Midwest and 22nd St., Hinsdale,

DuPage Co.—ESA-2, service station, restaurant area, East West Tollway between Meyers Rd. and Highland Ave., Downers Grove, $2,500,000.

Kane Co.—NSA-4, service station, restaurant area, Northwest Tollway, east of Beverly Rd., Elgin, $2,500,000.

Thornton—service station and restaurant areas, TSA-I, Tri State Tollway between Calumet Expressway and Halsted St., $2,500,000. Pace & Assocs., 53 W. Jackson Blvd., Chicago, Zone 4, archts. CD 6/4/54.

BUILDINGS—BA

▲ **Mich., Erie**—SCHOOL, etc.—BA 2/10—Bd. Educ. Mason Consolidated School Dist., Senior High School, swimming pool. $2,500,000. Louis C. Kingscott & Assoc., Inc., 511 Monroe St., Kalamazoo, archt.-engr. CD 11/6.

▲ **Ill., Chicago**—TEACHERS' COLLEGE—BA 2/23—Bd. Educ., 228 N. LaSalle St., Chicago Teachers' College, Bryn Mawr and St. Louis Ave. $5,500,000. Perkins & Will, 309 W. Jackson Blvd., Zone 6, archts. CD 8/1/57.

HEAVY CONSTRUCTION—LB & CA

▲† **James Lesk Co.,** 322 West 61 St., Minneapolis 19, Minn., LB $2,865,000, (16 bidders), ADMISSION and TREATMENT BLDG. NO. 98, at Veterans

Administration Hospital, DANVILLE, ILL. Veterans Admin., Munitions Bldg., Wash., D. C. Bids Jan. 12. CD 12/30.

BUILDINGS—LB & CA

▲ **Ralph Arnold and Thomas J. Dillon & Co., Inc.,** 969 Mayfair, Akron, O., CA Est. **$4,000,000,** 215 HOMES, N. Portage Path, between Merriman and Sands Run Rds., known as Parkway Estates, AKRON, O. Parkway Investment Co., c/o Herberich-Hall-Harter Co., 265 S. Main St., Akron, O.

▲ **Ferro Concrete Constr. Co.,** Gwynne Bldg., 602 Main St., Cincinnati, O., CA **$3,000,000,** 7 story, 130,000 sq. ft. HOME OFFICE addn., CINCINNATI, O. Western & Southern Life Insurance Co., 400 Broadway, Cincinnati, O. CD 1/14.

▲ **Charles Maescher & Co.,** Florence Ave., Cincinnati, O., CA Est. **$2,500,000,** 4 story, bsmnt., 87,750 sq. ft., limestone OFFICE, Main St., CINCINNATI, O. J. R. Williams Inv. Co., Fifth-Third Bank Bldg., Cincinnati, O. L. F. Peeler & Assocs., 6310 Denton Dr., Dallas, Tex., archts. Ziel-Blossom & Assocs., Gwynne Bldg., Cincinnati, O., engrs. Awarded Jan. 7.

▲ **Western Reserve University,** 2040 Adelbert Rd., Cleveland 6, O., recalled bids to have been opened Dec. 29, SCIENCE CENTER, CLEVELAND, O. **$5,494,770.** Will re-advertise. CD 12/28.

▲ **Paul Cowgill,** 2160 Tremont Center, Columbus, O., LB Est. **$2,000,000,** second phase, 160,000 sq. ft. KINGSDALE SHOPPING CENTER, COLUMBUS, O. Kingsdale Co., 2160 Tremont Center, Columbus, O. Walter Hansen, 1615 W. Lane Ave., Columbus, O., project archt.

▲ **Tonti Organization,** 3035 W. Broad St., Columbus, O., Owner Builds, **$4,000,000,** 200 HOMES, Brookshire West Subdivision, Richardson Ave., south of Mound St., COLUMBUS, O.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

January 26 Colorado — January 27 Arkansas
January 29 Minnesota, North Dakota
February 4 South Dakota

STREETS AND ROADS

January 26 Colorado — January 27 Arkansas
January 29 Minnesota, North Dakota
February 4 South Dakota

▲ **Tex., Houston**—WORLD TRADE CENTER—BA 3/1—Port Comn., Navigation Dist., c/o Wharf No. 3, Capitol Ave., World Trade Center, $2,764,000. Wilson, Morris, Crain & Anderson, 3330 Graustark St., archts. CD 12/23.

BUILDINGS—BA

▲ **Mo., Creve Coeur (St. Louis 41 P.O.)**—TEMPLE, etc.—BA 2/9—Temple Israel's Congregation, 5017 Washington Blvd., St. Louis, Zone 8, 150x190 ft. temple and 3-level, 77x99 ft., brick, limestone, concrete, steel educational bldg., Ladue and Spoede Rds. $2,100,000. Helimuth, Obata & Kassabaum, Inc., 315 N. 10th St., St. Louis, Zone 1, archts. Albert Alper, 6635 Delmar Blvd., University City, Zone 30, structural engr. Harold P. Brehn, 315 N. 10th, St. Louis, Zone 1, mechanical and electrical engr. CD 2/11.

HEAVY CONSTRUCTION—LB & CA

▲ **IOWA**—State Hy. Comn., Ames, Bids opened 1/12, Iowa—**Hallett Constr. Co.,** Crosby, Minn., LB **$626,479,** c. conc. 2.463 mi. I-80-7 (9) 270, Cedar Co.; LB **$553,469,** c. conc. 2.207 mi. I-80-8 (13) 273, Cedar Co.; LB **$126,046,** c. conc. 1.808 mi., FN-869, Cedar Co.; LB **$1,590,302,** c. conc. 5.842 mi. I-80-5 (6) 156, Jasper Co.; LB **$2,216,353,** c. conc. 8.455 mi. I-80-5 (8) 148, Jasper and Polk Counties; LB **$360,267,** b. conc. resurf. 14.214 mi., P-1108, Polk Co.

Iowa—**Booth & Olson, Inc.,** 529 Ins. Exch. Bldg., Sioux City, Iowa, LB **$497,902,** c. conc. 5.742 mi. F-232 (9), Crawford Co.

Iowa—**Mott Constr. Co.,** Centerville, Iowa LB **$436,528,** grading 8.714 mi. FN-1027, Wapello Co. CD 12/30.

▲† **Hoosier Engineering Co.,** 1350 Holly St., Columbus, O. CA **$3,080,053,** furnishing, stringing conductors and overhead ground wires for transmission lines between Fort Peck, Mont., and Bismarck, N. D., NORTH DAKOTA and MONTANA Bureau Reclamation, Dpt. Interior, Glendive, Mont. Bids Dec. 10. CD 12/14, under LB.

▲† **Tecon Corp.,** Davis Bldg., Dallas, Tex.; **Green Constr. Co.,** 321 Locust St., Des Moines, Iowa, and **Winston Brothers,** 301 Clifton Ave., Minneapolis, Minn., CA **$14,672,709,** spillway, power intake and powerhouse substructure, left abutment access road repair, Eufaula Dam, Canadian River, IFB CIVENG-34-066-60-31, OKLAHOMA. U. S. Eng., Box 61, Tulsa, Okla. Bids Dec. 17. CD 12/21, under LB.

▲ **City of Houston,** City Hall, Rm. 201, Houston, Tex., rejected bids opened Nov. 4, 68 mi., (1) two 24 in. c.i. water lines (2) six 42 in. concrete sanitary sewer lines, appurtenances (3) storm sewers and open drainage, 18- to 60-in. concrete pipe (4) sewage plant expansion, HOUSTON, TEX. LB **$4,646,883.** CD 11/11, under LB.

BUILDINGS—LB & CA

▲ **Norfolk Apartments, Inc.,** c/o Herman A. Scharhag, archt., 1806 Swift, North Kansas City, Mo., Owner Builds, **$6,500,000,** 27 bldgs., 540 unit NORFOLK APARTMENTS east of intersection US 71 and 69 and Russell Rd., 670-car parking, KANAS CITY NORTH, MO.

▲ **Quaker Valley Constructors,** Box B, Pittsburg, Kan. CA Est. **$6,000,000,** POLYETHYLENE PLANT UNITS, ORANGE, TEX. Spencer Chemical Co., Orange, Tex. CD 5/28.

▲ **R. E. Alderson,** 1812 N. Corcoran, Colorado Springs, Colo., CA Approx. **$5,000,000,** 12 story HOTEL addn., COLORADO SPRINGS, COLO. Broadmoore Hotel, Broadmoore, Colorado Springs, Colo. Edwin A. Francis, 218 E. Speer Blvd., Denver, Colo., archt. Carlisle Guy, 601 Mining Exchange Bldg., Colorado Springs, Colo., engr.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

January 29 Arizona — February 4, 11 California

STREETS AND ROADS

January 29, February 9 Arizona — February 10 California

▲† **Alaska, Clear**—COMPOSITE BLDG., etc.—BA 2/11—U. S. Eng., 1519 S. Alaskan Way, Seattle 4, Wash., Phase 2, Composite Bldg. No. 1, fire station, rearward communications facilities, security fence, passageway extension, etc. for Alaskan Air Command, Inv. 60-23. Over $2,375,000. CD 12/7.

BUILDINGS—BA

▲ **Calif., Auburn**—BUILDINGS—BA 2/4—Sierra Junior College Dist., 222 Finley St., 13 Sierra College buildings, near Rocklin. $2,000,000. Gordon Stafford, 1024½ J St., Sacramento, archt. CD 11/7/57.

▲ **Calif., Los Angeles**—CLASSROOM BLDGS., etc.—BA 2/5—Los Angeles Bd. Educ., 1425 S. San Pedro St., classroom bldgs. and administration bldg., Los Angeles City College, 885 North Vermont Ave. $4,200,000. CD 12/11/57.

▲ **Calif., Sacramento**—SCHOOL—BA 2/8—Sacramento City Unified School Dist., 1619 N St., Will C. Wood Junior High School, Lemon Hill Ave. east of Stockton Blvd. $2,000,000. CD 4/2.

HEAVY CONSTRUCTION—LB & CA

▲ **WASHINGTON**—State Hy. Comn., Olympia, Morrison-Knudsen Co., Inc., 319 Broadway, Boise,

Concrete mix would grind the markings off most tapes!

This is Lufkin's Mezurall® tape . . . with unmatched Chrome Clad® blade that fights concrete, sand, mud and other abrasives.

Lufkin starts with a special tempered steel . . . bonds the markings to it. Then layer after layer of electroplating is applied, topped by a final layer of tough chrome. There's no other blade like it. Comes in 6′, 8′, 10′ and 12′ lengths . . . either ½″ or ¾″ widths. The Lufkin Rule Company, Saginaw, Mich.

THE LUFKIN RULE COMPANY
TAPES • RULES • PRECISION TOOLS

Idaho, and Rumsey & Co., 3821 Airport Way, Seattle 4, Wash., CA $3,982,242, est. $5,700,000, bridges on Seattle freeway from Galer St. to Lakeview Blvd., King Co. Bids Nov. 24, awarded Jan. 5. CD 11/27, under LB.

▲ CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles, Bids opened 1/6,
Gibbons & Reed, 825 West 9th North St., Salt Lake City, Utah, LB $4,065,797 (20 bidders), grading, surf. to relocate 5.1 mi. section US 299 around future Bureau of Reclamation Whiskeytown Reservoir between 2.5 mi. east of Tower House and 2.5 mi. east of Whiskeytown, 11-SHA-20A, Shasta Co. CD 11/25.

▲† Peter Kiewit Sons Co., 345 Kieways Ave., Arcadia, Calif., LB $30,157,149, est. $31,702,258 (8 bidders), WS 107-A-2, T-5 Titan missile silos, equipment and propellant terminals, etc., Complex 1A, vicinity Lincoln, Placer Co.; Complex 1B, near Pennington, Sutter Co., Complex 1C, near Chico, Butte Co., Spec. 2639, ENG-04-167-70-23, near BEALE AIR FORCE BASE, CALIF. U. S. Eng., 1209 8th St., Sacramento, Calif. Bids Jan. 12. CD 12/15.

BUILDINGS—LB & CA

▲ J. G. Watts Constr. Co., 672 South Lafayette Park Place, Los Angeles, Calif., LB $2,000,747 (12 bidders) Third Unit, 3 story, 102,400 sq. ft. concrete frame SCIENCE BLDG., Long Beach State College, W.O. 4160GC-30, LONG BEACH, CALIF. State Div. Architecture, 1100 S. Grand Ave., Los Angeles, Calif. Bids Jan. 6. CD 11/27.

▲ Robert McLean Co., 135 Cobblestone, San Rafael, Calif., CA $2,500,000, 40 lane BOWLING ALLEY, SAN FRANCISCO, CALIF. Mel Weiss & Harold Dobbs, Mel's Enterprises, c/o Goodwin B. Steinberg, archt., 302 Main St., Los Altos, Calif. CD 7/23.

▲ Rothschild, Raffin & Weirick, 875 Sansome St., San Francisco, Calif., CA $3,638,735, site preparation and Phase I of ADMINISTRATION BLDG., Santa Venetia Area, SAN RAFAEL, CALIF. Bd. Supervs. Marin County Courthouse, San Rafael, Calif. Bids Dec. 22. CD 1/4, under LB.

▲ Haas & Haynie, 244 Pine St., San Francisco, Calif., CA $4,000,000, HOTEL and SHOPS; $1,000,000, COTTAGES and HUNTING LODGE, near Waimea; $500,000, golf course and club house, Kaunaoa Beach, HONOLULU, HAWAII. Pacific Resorts Inc., c/o Kenneth F. Brown, archt., 1753 Kapiolani Blvd., Honolulu, Hawaii. Grand total $5,500,000.

▲ Haas & Haynie, 244 Pine St., San Francisco, Calif., CA Est. $14,000,000, HOTEL, SWIMMING POOL, HONOLULU, HAWAII. Sheraton Hotels, Inc., 2259 Kalakaua St., Honolulu, Hawaii. CD 1/13.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
February 20 Ontario

BUILDINGS—LB & CA

▲ Canadian Westinghouse Co. Ltd., 286 Sanford Ave., Hamilton, Ont., CA Total est. $2,500,000, 30,000 kwt., GAS TURBINE GENERATOR, VERMILLION, ALTA. Canadian Utilities Ltd., Milner Bldg., 10040-104th St., Edmonton, Alta. CD 2/7/51.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ PARAGUAY—Dpt. P. Wks. & Communications, Govt. of Paraguay, Ascuncion,
Williams Brothers Co., Tulsa National Bank Bldg., Tulsa, Okla., U.S.A., CA 80.73 mi. road from Filadelfia to Juan de Zalazar.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

▲ Williams Brothers Co., National Bank of Tulsa Bldg., Tulsa, Okla., U.S.A., CA, 240 mi. 8 in. petroleum products line from Rey near Tehran to Sharud, IRAN. National Iranian Oil Co., Tehran, Iran.

PROPOSED PROJECTS

WATER SUPPLY

▲ N. C., Wilson—City, City Hall, voted $2,500,000 bonds Dec. 19, water system.

SEWERS, WASTE DISPOSAL

▲ Conn., Westport—Town, Town Hall, sewer extensions. $3,000,000. Goodkind & O'Dea, 1214 Dixwell Ave., Hamden, consult. engrs.

▲ Me., Caribou—Town, Town Office, 3 High St., sewerage collection sys. and sewage plant. $1,507,000. To go ahead June 1961.

▲ Va., Martinsville—City, City Hall, bond election Mar. 1, sewerage imprvt. program, $3,500,000, Wiley & Wilson, Courtland Bldg., Lynchburg, consult. engrs.; sewage disposal sys., $834,634. CD 6/2/50.

STREETS AND ROADS

▲ OHIO—State Dpt. Hys., State Dpt. Bldg., Columbus,
Lucas Co.—wid'n. 0.31 mi. Detroit Rd. between Byrne Rd. and Anthony Wayne Trail, Toledo, $120,000.
wid'n. about 7 mi. Monroe St. from Main St. in Sylvania to South Cove Blvd. in Toledo, $4,000,000.
Ottawa Co.—wid'n. 5.86 mi. St. Rte. 579 from Clay Center Rd. to Rte. 2, Clay Center, $700,000.
Williams Co.—relocation 1.78 mi. US 127 just north of Bryan, $500,000.
Wood Co.—wid'n., resurf. 9 mi. State Rte. 199 between US Rtes. 6 and 20, $1,200,000. Bids in Spring.

EARTHWORK, WATERWAYS

▲ N. J., Asbury Park—City, City Hall, extension of 1st, 4th, 6th Ave. and Deal Lake jetties. $2,500,000. Wm. M. Birtwell, City Hall, engr. CD 1/4/46.

AIRPORTS

▲ Hawaii, Hoolehau—AIRPORT IMPRVS.—Hawaii Aeronautics Comn., Honolulu International Airport, Honolulu, runway reconstr. and install catch basins, $300,000; extending runway and lighting, $1,750,000.

▲ Hawaii, Kahului—RUNWAY EXTENSION, etc.—Hawaii Aeronautics Comn., Honolulu International Airport, Honolulu, runway extension, $2,200,000; passenger terminal, four plane hangar and field lighting, $500,000.

▲ Hawaii, Kailua-Kona—AIRPORT IMPRVS.—Hawaiian Aeronautics Comn., Honolulu International Airport, Honolulu, extension of Kailua-Kona runway by 600 ft. at airport, $265,000; constr. airport at site near Kailua-Kona with 6,000 ft. runway, terminal, lighting, access roads and facilities, $2,400,000.

▲ Hawaii, Lanai—AIRPORT IMPRVS.—Hawaii Aeronautics Comn., Honolulu International Airport, Honolulu, extend runway, constr. terminal, hangars and install lighting, $1,780,000.

▲ Hawaii, Lihue — ADDNL. AIRCRAFT, etc. — Hawaii Aeronautics Comn., Honolulu International Airport, Honolulu, addnl. aircraft and auto-parking space and 3 plane hangars, $325,000; extend runway, install lighting and build control tower, $2,000,000.

PUBLIC BUILDINGS

▲† Calif., Los Angeles—CUSTOM HOUSE, etc.—General Services Admin., Rm. 6119, 18th and F Sts. N.W., Wash. 25, D. C., plans by Welton Becket & Assocs., 5657 Wilshire. Albert C. Martin & Assocs., 333 S. Beaudry, and Paul R. Williams & Assocs., 3757 Wilshire, 8 story, 1,200,000 sq. ft. modern, air-conditioned U. S. Custom House and Federal Office, east side of Los Angeles St. between Temple and Aliso Sts. $31,154,000. Phase of project is scheduled for completion by September 1960. CD 6/11/56.

▲ Calif., San Jose—COUNTY OFFICE—Bd. Supervs. Santa Clara Co., Courthouse, plans by Paul James Huston, AIA, 744 Cowper St., Palo Alto, 4 story concrete, steel frame county office, Palo Alto. $1,500,000. Bids in June. CD 3/16.

▲ Conn., Westport—SCHOOLS—Town, Town Hall, Coleytown Junior High School, $1,500,000; elementary school, Hills Point Rd., Compo Mill, $1,100,000. Bids in 1961. Goodkind & O'Dea, 1214 Dixwell Ave., Hamden, consult. engrs.; CD 3/25; Bedford Junior High School addn., $650,000; high school addn., $500,000 elementary school, Stony Brook Rd., $1,100,000.

▲ Ill., Streator—SCHOOL—Bd. Educ., voted $1,998,000 bonds Nov. 24, Streator Twp. High School. Bradley & Bradley, 924 Main St., Rockford, archts. CD 11/6.

▲ Iowa, Muscatine—SCHOOL—Bd. Educ., Community School Dist., voted $1,100,000 bonds Dec. 4, McKinley Elementary School and Junior High School. $1,500,000. Stanley Eng. Co., Hershey Bldg., Muscatine, archt. CD 12/16/53.

▲ Md., Glen Burnie—MOTOR VEHICLES—State, Dpt. P. Imprvts., 301 W. Preston St., Baltimore, Zone 1, plans by Fletcher & Fletcher, 2117 N. Charles St., Baltimore, Zone 18, 2 story, masonry bldg. for Department of Motor Vehicles, Ritchie Hy. $3,500,000 (no appropriation).

▲ Minn., St. Paul—TECHNICAL-VOCATIONAL HIGH SCHOOL—Bd. Educ. Special School Dist. No. 2, technical-vocational high school, Louis St., Marshall, Carroll and Western Aves. $5,312,000. CD 11/9.

▲ Mo., Riverview Gardens (St. Louis 36 P. O.)—SCHOOLS—School Dist. of Riverview Gardens, Bd. Educ., 1912 Chambers Rd., Zone 36, $2,085,000 bond election Feb. 9, Junior High School, over $400,000; Senior High School and Lemaster and Thomas Elementary School addns., Manske & Dieckmann, 9945 Riverview Dr., Zone 36, archts., and Hellmuth, Obata & Kassabaum, Inc., 315 N. 10th St., Zone 1, assoc. archt. CD 3/17.

▲ N. J., Belleville—SCHOOL—Bd. Educ., high school, $2,730,000.

▲ N. Y., Long Beach—SCHOOL—City, City Hall, $1,800,000 bond election Jan. 26, Lido Junior High School addn. CD 1/22.

▲ N. C., Butner—DORMITORY, etc.—N. C. Hospital Bd. Control, Revenue Bldg., Raleigh, plans by Harris & Pyne, 504 Snow Bldg., Durham, 540-bed dormitory, Murdock school area, over $1,000,000; renovating 5 wards, John Umstead area, Butner State Hospital, $1,800,000. CD 11/18/53.

▲ O., Cincinnati — HOUSING — Cincinnati Metropolitan Housing Auth., 595 Armory, plans by Cellarius & Hilmer, 4th and Main Sts., 163 two story, bsmnt. bldgs., Beekman St. housing addns. $1,630,000. CD 9/5.

▲ Tex., Austin—OFFICE—State of Texas, Main Administration Bldg., plans by Keuhne, Brooks & Barr, Perry-Brooks Bldg., and Golemon & Rolfe, 5100 Travis St., Houston, office for Game Commission, Public Welfare, Banking Commission, and examining boards, $3,000,000. CD 2/20/51.

▲ Tex., San Antonio—POWER PLANT, etc.—City Public Service Bd., 145 Navarro St., electric power plant, Elmendorf, $13,500,000; electric power transmission lines, Elmendorf, up to $5,000,000; dam across Seco Creek, $1,000,000.

▲ Va., Richmond—CITY JAIL—Dpt. P. Wks., 217 Governor St., city jail. $3,300,000. CD 10/20.

▲ Ont., Toronto—HOSPITAL, etc.—Ontario Dpt. P. Wks., Queens Park, Provincial Psychiatric Hospital and Institute, College and Huron Sts. $5,000,000. University of Toronto will operate Institute section of hospital.

▲ Ont., Toronto—SCHOOL OF MUSIC, etc.—University of Toronto, Simcoe Hall, plans by Gordon Adamson & Assocs., 52 St. Clair Ave. W., School of Music, south of Royal Ontario Museum, Queen's Park, $2,500,000; plans by Shore & Moffat, 51 Wellington St. W., physics bldg., Huron and Russell Sts., over $400,000; residential college for graduates, Devonshire Place and Hoskin Ave. $1,500,000.

▲ Que., Westmount—SCHOOL—Westmount Protestant School Comn., 10 Academy Rd., plans by deBelle & White, 5925 Monkland Ave., Montreal, high school, Westmount Athletic Grounds, St. Catherine St. W. $2,500,000. T. G. Anglin, 4294 St. Catherine St. W., Montreal, consult. engr. CD 12/6/58.

COMMERCIAL BUILDINGS

▲ Alaska, Anchorage—HOTEL—Alaska Hotel & Investment Co., c/o Gene's Realty, Anchorage, plans by H. T. Harstad & Assocs., 1000 Lenora St., Seattle, Wash., 300-room hotel. $6,500,000. CD 9/9/58.

▲ Calif., San Francisco—APARTMENT, etc.—Joseph Blumenfeld, Blumenfeld Theaters, 70 Eddy St., 6 story, 52-unit apartment, bowling alley, commercial office, 2 floor parking, Masonic St. near Geary Blvd. $1,500,000.

▲ Fla., St. Petersburg—APARTMENTS—Vista Corp., c/o M. Tony Sherman & Assocs., archts., 1101 NE 79 St., Miami, Colonial Village, 190 unit apartments, store, professional bldgs., club house, swimming pool, etc., 38 Ave. and 66 St. $3,500,000.

▲ Hawaii, Honolulu—HOTEL—Alexander Young Co., 1015 Bishop, plans by Vladimir Ossipoff, Hawaiian Life Bldg., 10 story Alexander Young Hotel. $2,000,000.

▲ Ill., Chicago—UNIVERSITY—Loyola University, 6525 N. Sheridan Rd., university center, corner Rush and Pearson Sts., $3,250,000; 3 story science bldg., Lakeshore Dr. campus, $1,500,000; University Center, Lakeshore campus, $1,500,000.

▲ Ill., Chicago—HOTEL, etc.—R. J. Scher & John J. Mack, 201 E. Walton Pl., plans by Shaw Metz & Assocs., 208 S. LaSalle St., Zone 4, 12 story, 400 room hotel, 300 car garage, Michigan Ave. and Delaware Pl. $8,000,000.

▲ Ill., Jacksonville—SCIENCE HALL—Illinois College, Jacksonville, science hall, Rammelkamp Chapel, completion physical educ. bldg., remodeling Jones, Whipple and Sturtevant Halls, $1,500,000. CD 10/23/56.

▲ Md., Baltimore—APARTMENT—Evans Realty Co., 3412 Old Forest Rd., Zone 8, 30 E. Sunrise Hy., Lindenhurst, N. Y., plans by Schwab, Jewell & Wolf, 2506 N. Charles St., Baltimore 18, Md., Mt. Royal Plaza Development to incl. two 14 story, 86x86x64x 174 ft. concrete, steel, brick, stone trim apartments. $2,500,000. Henry Adams, Inc., 2315 St. Paul St., Zone 18, mechanical engr.

▲ Md., Baltimore—HOSPITAL—St. Joseph's Hospital, 1400 Block N. Caroline St., plans by Fisher, Nes, Campbell & Assoc., 2120 N. Charles St., Zone 18, 2 and 4 story, 80 x 400 ft., brick, concrete, steel, stone, slag roof hospital, York Rd. near Shepherd Pratt Hospital, to incl. heating plant, near here. $6,000,000. W. P. R. Saxe, 1701 St. Paul St., Zone 2, structural engr. Whitman, Requardt & Assoc., 1304 St. Paul St., Zone 2, mechanical engrs. CD 1/15/45.

▲ Md., Towson—OFFICE—The Greater Towson Development Corp., Campbell Bldg., Zone 4, plans by Hopkins & Pfeiffer, 10 E. Mulberry St., Baltimore, Zone 2, 7 story, 167,000 sq. ft., masonry office, York Rd., near here. $3,000,000.

▲ Mass., Boston—LIBRARY OF MEDICINE—Harvard Medical School, 25 Shattuck St., Francis A. Countway Library of Medicine. $5,000,000. Constr. 1960.

▲ Mass., Roxbury—APARTMENTS—Beacon Redevelopment Corp., c/o Hugh A. Stubbins & Assocs., archts., 806 Mass Ave., Cambridge, housing apartments, off Whitney St. $3,500,000. CD 1/8, under World Trade Center, as owner.

▲ Mass., South Boston—SHOPPING CENTER—Samuel P. Coffman, 41 Tremont St., Boston, 2-level shopping center, with underground parking area, William T. Morrissey Blvd. and Mt. Vernon St. $2,000,000. Constr. 1960.

▲ N. J., Montclair—HOUSES—Green Homes, Inc., 244 Watchung Ave., Glen Ridge, 29 houses, Alexander Ave., $1,500,000.

▲ N. J., North Caldwell—HOUSES—Benjamin Lee, 4-21 Banta Place, Fairlawn, 95 houses, roads off Smull Ave. $3,000,000. LeRoy Sullivan, 435 Bloomfield Ave., Caldwell, consult. engr.

▲ N. J., Waldwick—HOUSES—Alron Constr. Co., 135 Crescent Ave., 157 houses, off Mary Lane, $3,000,000.

▲ N. Y., Aurora—SEMINARY BLDGS.—Catholic Diocese of Buffalo, 35 Lincoln Parkway, Buffalo, 12 seminary

bldgs., Knox Rd. $6,000,000. Brother Cajetan Baumann, 44 Whitehall St., New York, Zone 4, will design master plan and chapel. CD 11/11.

▲ Tex., Houston—STORE—Fed-Mart Corporation, 4623 Blanco Rd., San Antonio, 100,000 sq. ft., masonry store, Wirtz Rd. near Hempstead Rd., $1,500,000; masonry stone, N.E. section of city, $1,350,000; masonry store, S.W. section of city, $1,150,000.

▲ Tex., Houston—SCHOOL—Jesuit School, c/o Frank W. Sharp, Oak Forest State Bank Bldg., high school, 83-acre tract, Sharpstown. $3,000,000.

▲ Ont., Timmins — HOSPITAL — Sisters of Providence, 1481 Fullum St., Montreal, Que., plans by Rudolph Papanek & Assocs., 25 Balsam St., 100-bed, 4 story, bsmnt., L-shape, 130 x 160 ft., rein.-con., structural steel frame, brick St. Mary's Hospital. $1,400,000-$2,000,000. C. D. Carruthers & Wallace Consultants, Ltd., 92 Yorkville Ave., Toronto, consult. engrs. Tenders in March. CD 4/13/56.

▲ Ont., Toronto—OFFICE—Owner, c/o Harry B. Kohl, archt., 1407 Yonge St., 10 story, 149,760 sq. ft. office, three-level parking garage, St. Clair Ave. W, just west of Yonge St. $1,500,000.

▲ Ont., Toronto — APARTMENTS — Toronto Industrial Leaseholds Ltd., 12 Shepherd Ave. and Webin Community Consultants, 85 Lombard St., plans by Irving Grossman, 7 Sultan St., 8 story apartments, Flemingdon Park Development, Eglinton Ave. and Don Mills Rd. $5,000,000. Project Planning Assocs. Ltd., 40 Irwin Ave., and Webin Community Consultants, 85 Lombard St., consult. engrs.

▲ Que., Montreal—OFFICE—Claremont Holdings Ltd., c/o Grattan D. Thompson, 4135 Sherbrooke St. W., 10 story, 2 sub-bsmnts., 69 x 79 ft., reinforced frame, granite, stone office, N.E. corner of Claremont Ave. and St. Catherine St. $1,500,000.

INDUSTRIAL BUILDINGS

▲ Calif., Richmond—RESEARCH CENTER—Stauffer Chemical Co., 1415 South 47th St., plans by Gerald M. McCue & Assoc., 2007 Hopkins St., Berkeley, rein.-con., wing-type research center. $1,600,000. CD 12/8.

▲ Conn., Hamden—PLANT—Edwin V. Larsen, 405 Temple St., New Haven, industrial plant, adjacent to Wilbur Cross Parkway. $3,000,000.

▲ Hawaii, Oahu—REFINERY ADDN., etc.—Standard Oil Co. of California, 225 W. Bush St., San Francisco, Calif., refinery addn., incl. 13,000 B/D fluid catalytic cracker and alkylation plant, hydrogenation and isomerization units for special products, feed stocks, boiler, dust precipitator, sulfur recovery equipment and storage. $30,000,000.

▲ Ill., Harvard—FACTORY—Admiral Corp., 3800 W. Cortland St., Chicago, plans by Ray Peterson, 4014 W. Dempster St., Skokie, television parts factory. $2,000,000. CD 2/13/57.

▲ Iowa, Tracy—GENERATING PLANT—Iowa Power & Light Co., 823 Walnut St., Des Moines, Zone 3, 150,000 kw. generating plant, near here. $20,000,000. Constr. 1960.

▲ Mass., Sudbury—LABORATORY—Sperry Gyroscope Div. Sperry Rand Corp., Great Neck, N. Y., laboratory. Approx $2,000,000.

▲ Minn., West St. Paul—INDUSTRIAL DEVELOPMENT—Tilsenbilt Homes, Inc., 625 Snelling Ave. South, St. Paul, plans by Community Planning & Design Assocs., consult. archts., 2645 University Ave., St. Paul, industrial development project, Lothenbach Rd. and S. Robert St. $16,000,000. CD 8/19, under Commercial Buildings.

▲ Mo., Affton (St. Louis 23 P.O.)—WAREHOUSE—Wohl Shoe Co., 1601 Washington Ave., St. Louis, Zone 3, 1 story, 550 x 650 ft., 365,000 sq. ft. open steel metal curtain walls, steel deck and concrete floor warehouse, parking, railroad spur on Valcour Rd. Over $2,000,000. Neal J. Campbell, 911 Locust St., St. Louis 1, Mo., consult. engr. for structural and architectural design of bldg. Bids about Jan. 15.

▲ O., Alliance—PLANT—Morgan Engineering Co., Alliance, 72,000 sq. ft. plant expansion; 1 story, steel frame, masonry, main bldg.; 55,200 sq. ft. yard storage area; 19,000 sq. ft. plant redesign and remodeling. $1,800,000.

▲ Pa., Hatfield—PLANT—American Machine & Metals, Inc., Lansdale, 180,000 sq. ft. plant, $3,500,000.

▲ Pa., King of Prussia—TECHNICAL CENTER—Penn Salt Chemical Corp., 3 Penn Center Plaza, technical Center, $6,000,000.

▲ Pa., Spring House—PLANT—Moore Products Co., H and Lycoming Sts., Phila., plant and headquarters, 1 story, 72,000 sq. ft. mfg. area, 2 story, 48,000 sq. ft. office wing, $1,500,000.

▲ Tenn., Nashville—PLANT—Gates Rubber Co., 992 S. Broadway, Denver, Colo., tire production plant. $1,500,000. Robert Ryerson, L & C Bldg., Nashville, design engr.

▲ Tex., Houston—PARKING GARAGE—Foley's Parking Garage, 811 Dallas Ave., plans by Lloyd & Morgan, 4605 Montrose Blvd., 10 story, 200,000 sq. ft. concrete frame, parking garage, $1,500,000. I. A. Naman & Assocs., 3305 Montrose Blvd., engrs.

▲ Tex., Plano—PLANT, etc.—Lone Star Boat Co., 1930 E. Main St., Grand Prairie, plans by Jacob E. Anderson, 610 Thomas Bldg., Dallas, 340,000 sq. ft. boat mfg. plant, and small office, $2,000,000.

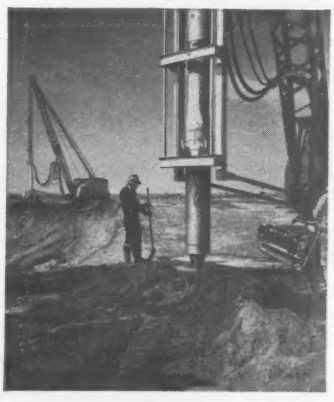
▲ Alta., Calgary—MILL—Western Rolling Mills, Ltd., c/o Ace Salvage Alberta Ltd., 2807 Portland St., steel rolling mill, Bonnybrook. $1,500,000.

(Proposal Advertisements see pp. 87 to 89)

Cascade Kraft Corporation, Pulp & Paper Mill, Wallula, Wash.
Structural Engineers: R. M. Tracey & Associates, Seattle, Wash.
Contractor: Swinerton & Walberg, Oakland, Calif.
Soil Consultant: Dames & Moore, Portland, Oregon

Vibroflotation®

was used to compact the sandy soil at paper mill in Wallula, Washington.



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The foundations for a new paper mill of the Boise-Cascade Corp. at Wallula, Washington, were built on sand compacted by VIBROFLOTATION. A total of 1304 compactions were made to an average of 15 feet below the bottom of footings.

Vibroflotation provided a substantial saving of about $35,000 over alternate piling foundation solution. Additional savings were realized through elimination of all formwork for footings.

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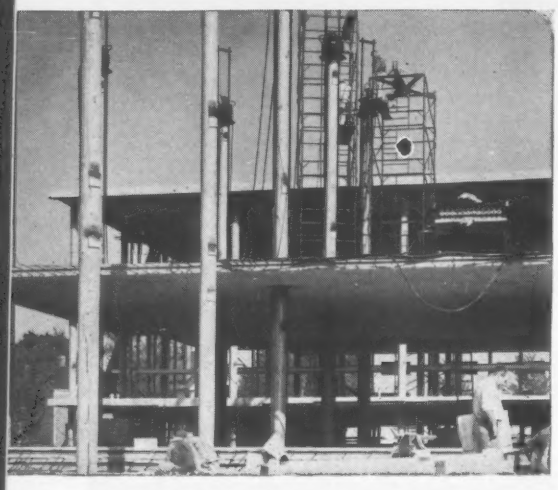
1. REPUBLIC HIGH STRENGTH BOLTS saved valuable time and labor in the construction of the new Bobbie Brooks, Inc., warehouse in Cleveland, Ohio. Two-man crews installed the bolts quickly and easily on the 80-foot, double-pitched main trusses. Design and construction by The Austin Company, Cleveland, Ohio. Erection schedules are easily met or even shortened with Republic High Strength Bolts. Check coupon for illustrated folder.



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Architects: Milton M. Schwartz & Associates, Inc., Chicago, Illinois. Stainless Steel Panels fabricated by Haskelite Manufacturing Corporation, Grand Rapids, Michigan.

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Contracts...

AMOUNT OF CONTRACTS LET

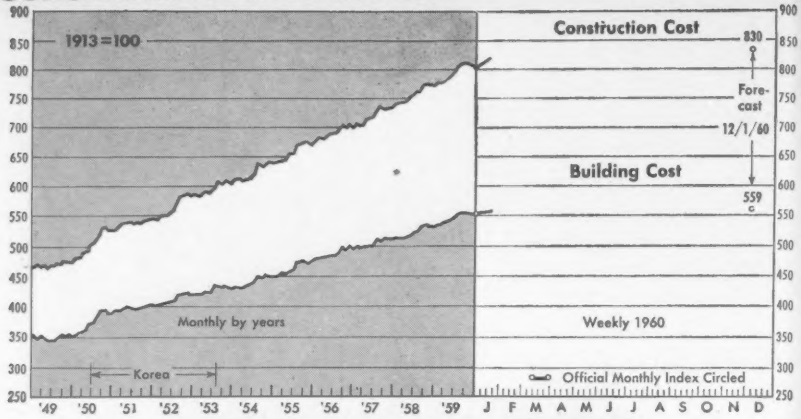
	This Week millions	Cum. 3 wks# 1960	Chge '59-'60 %
All Heavy Constr.	$372.9	$1,019.9	+22
By Ownership			
PRIVATE	203.5	530.6	+95
PUBLIC	169.4	489.3	−13
State & Municipal	100.8	336.8	−20
Federal	68.6	152.5	+ 6
By Type of Work			
PUBLIC			
Waterworks	2.1	14.7	−24
Sewerage	7.3	36.0	− 5
Bridges*	22.6	39.1	−19
Highways	23.6	126.6	−23
Earthworks, Dams & Waterways	24.8	49.2	+72
Buildings:			
Excl. Housing	27.2	73.5	−56
Housing	14.5	45.9	+140
Unclassified	47.6	104.7	+34
PRIVATE			
Buildings:			
Mass Housing	89.6	205.5	+77
Commercial	72.4	140.6	+116
Industrial	37.4	155.5	+91
Unclassified	3.8	28.6	+198

*Includes private bridges
#Revised to include Alaska and Hawaii

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

CAPITAL . . .

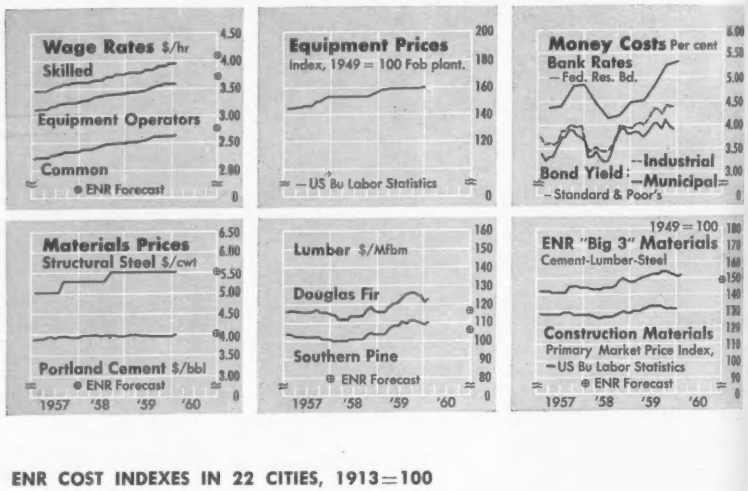
New Capital For Construction	Week of Jan. 14 millions	Cum. 2 wks 1960	Chge '59-'60 %
Corporate Securities	$50.0	$50.0	+ 3
State and Municipal:			
All Except Housing	260.2	379.2	+62
Housing	0.6	0.6	....
Federal Loans	0.9	1.6	−48
Federal Aid	....	....	....
Total Nonfederal	$311.7	$431.4	+51
Federal Appropriations:			
Projects in U. S.	....	....	....
Outside U. S.	....	....	....
Total New Capital	$311.7	$431.4	+51



CURRENT ENR COST INDEXES

ENR INDEXES (1913=100), 20-cities' average	Week of Jan. 14 1960	% Change from Dec. 17 1959	% Change from Jan. 15 1959
Construction Cost	813.19	+0.5	+4.4
Building Cost	555.69	+0.4	+3.6

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.



ENR COST INDEXES IN 22 CITIES, 1913=100

City	Construction Cost Jan. 1960	Construction Cost Percent Change from last Month	Construction Cost Percent Change from last Year	Building Cost Jan. 1960	Building Cost Percent Change from last Month	Building Cost Percent Change from last Year
Atlanta	638.70	+2.5	+7.6	500.83	+0.3	+5.8
Baltimore	743.80	−0.2	+4.9	556.64	−0.3	+2.7
Birmingham	652.08	0	+4.9	515.92	+0.2	+4.1
Boston	827.56	+0.6	+2.5	559.23	+0.9	+3.0
Chicago	920.88	+0.5	+7.2	583.77	+0.7	+3.9
Cincinnati	813.71	0	+4.8	539.23	+0.1	+4.6
Cleveland	920.68	0	+3.6	554.35	0	+3.7
Dallas	604.04	0	+5.4	491.30	+0.2	+4.7
Denver	746.52	0	+2.2	544.60	0	+2.3
Detroit	960.02	+0.1	+7.6	596.24	+0.2	+3.8
Kansas City	798.46	+0.1	+4.0	552.67	0	+3.7
Los Angeles	868.20	0	+5.4	553.81	0	+4.6
Minneapolis	860.16	+0.1	+2.5	569.61	+0.2	+2.9
New Orleans	641.19	0	+3.9	511.07	0	3.5
New York	1,013.30	+0.5	+5.3	647.78	+0.8	+3.8
Philadelphia	790.91	0	−0.1	577.76	0	+1.4
Pittsburgh	849.38	0	+2.7	600.54	0	+0.9
St. Louis	877.94	+0.5	+4.0	577.01	+0.7	+1.9
San Francisco	853.34	+0.4	+5.0	552.66	+0.7	+3.7
Seattle	861.60	+3.7	+4.1	504.18	+0.9	+3.7
U. S.—20 Cities' avg.	812.03 R	+0.4	+4.3	554.34	+0.3	+3.4
Montreal	630.39	0	+4.4	458.76	0	+2.1
Toronto	666.99	+5.8	+4.4	489.29	+0.2	+1.9

More Capital for Small Business?

- **That would be the result of a bill that would help growth of small business investment companies.**
- **Prospects for the bill improved this week when the President backed it in his budget message.**

President Eisenhower this week threw his support to Democratic-sponsored legislation aimed at making finance capital more available to smaller businesses. The effect of the legislation would be of direct and immediate importance to the construction industry.

In his new budget (p. 21) the President recommended passage of a bill sponsored by Sen. William Proxmire (D., Wis.) that would liberalize the operation and financing procedures of small business investment companies.

These "SBIC's" are privately owned finance companies that are being organized under a Small Business Administration program to channel money into small business sources.

The program has had a number of ups and downs since it was born in 1958. After a hopeful start, the program ran into a number of bureaucratic snags and has been lagging.

Senator Proxmire's bill by no means would solve all the problems still facing the program. But it would give SBIC's more flexibility in the investments they can make. The investment companies now are restricted to making either loans or purchasing convertible debentures of small firms seeking capital. Senator Proxmire's bill would allow SBIC's to engage in any sort of financing, including direct purchase of common stocks, securing warrants, bonds, etc.

This new flexibility, President Eisenhower and Senator Proxmire hope, would encourage the formation of SBIC's.

As of now, SBA has licensed 68 SBIC's around the country, and has proposals pending from about as many more groups interested in setting up an investment company.

Practically all SBIC's to date fall into two categories: Those formed by banks and investment people; and those formed by builders and developers.

At least half of the SBIC's have given as one of their primary objectives the financing of builders, contractors and related industries.

And two of the companies have been formed exclusively for this purpose. This month, SBA approved the license of a Baltimore SBIC, the Interstate Business Investment Co., whose primary emphasis is investing in land development and homebuilding companies; in November, the Regional Building Investment Corp. of Detroit was launched to steer capital to building materials supply companies, fabricators and homebuilding products and allied businesses.

The President's support of the Proxmire bill gives it a good chance of passage this session. However, this would be only one step needed to produce a real flowering of the SBIC program.

The Senate Small Business Committee has scheduled hearings next month into the slowdown on the program and ways to stimulate it.

SBA officials, who are sensitive to criticism of the program, contend it is necessary to proceed slowly on a new program of investment banking. They point out that until 1958, there was no similar setup to meet small business needs.

Critics contend, however, that SBA is going overboard on exactly this point. They say the Administration is overloaded at the top with people who take the approach of conservative investment bankers, used to dealing with larger corporations, for a program aimed at small business.

These critics note that of the 68 SBIC's approved to date, 38 are in only eight states having relatively sophisticated financial centers: Texas (8 SBIC's); New York and California (7 each); Maryland (6); Florida and Wisconsin (5 each).

One of the big reasons for the interest of contractors and real estate developers in setting up SBIC's is their familiarity with federal financing procedures. They have learned to take government red tape in stride.

The 68 SBIC's to date have been organized with about $48 million in capital available for loans. However, a few of the SBIC's have gone to the public with stock issues to raise more funds for lending.

The trade group for SBIC's, the National Association of Small Business Investment Companies, expects practically all of the SBIC's to take this approach within the next two years. This would bring in many more times the original capitalization.

Business in Brief . . .

• **Tunnel financing study**—The Washington Toll Bridge Authority will make a $100,000-study of the feasibility of cutting a tunnel through the Cascade Mountains at Naches Pass, about 60 miles east of Tacoma. This study, the fourth so far, will investigate means of financing construction costs through participation of communities, such as Tacoma, that would benefit from the tunnel.

• **Prefab push in Europe**—Nine European countries will try developing an international market in prefabricated building components and in prefabricating machinery. France, Italy, Belgium, the Soviet Union, Poland, Rumania, Bulgaria, Hungary and Czechoslovakia joined in the agreement at an industrial production symposium in Geneva last month.

• **Court favors property owners**—Property owners in commercial districts no longer need to provide off-street parking facilities for new construction projects. That's the legal ruling of the Colorado Supreme Court, which just invalidated such a provision in the three-year-old Denver Zoning Code. The judge's opinion said the code's off-street parking provision is unconstitutional because it involves taking private property for a municipal function without just compensation to the owner.

• **Dividing the work**—The Detroit Board of Education has appointed 17 architects to design the first 17 schools in its $90-million building program. Total estimate on the assigned projects is $23.8 million, ranging in size from a $300,000 conversion job to a $3.8-million junior high school.

High Court May Get Zoning Dispute

A dispute between a property owner and a zoning commission over larger minimum sizes for house lots may be settled by the U. S. Supreme Court. Any decision on this generally controversial subject by the court could have far-reaching effects on the economic development of suburbs.

A New Canaan, Conn., property owner is appealing from a decision of the Connecticut Supreme Court of Errors, upholding the right of New Canaan's Zoning Commission to upgrade acreage as a means of controlling residential and industrial expansion. New Canaan is a "bedroom" community for New York City.

Involved is a 436-acre tract that was upzoned from two acres per proposed house lot to four acres per lot. The owner had planned to sell the land for development on two-acre sites.

The Zoning Commission had "the right to decide whether the establishment of a superior residential district would be the most appropriate use of this unspoiled area," the court said.

But the owner contends the commission's action violated the Fourteenth Amendment "unless some basis can be found in the police power to justify the action."

If there is no basis for exertion of police power, the action "constitutes a taking of property without due process of law and without just compensation and a denial to appellant of the equal protection of the laws," he says.

"Where such arbitrary action is taken in a suburb of the largest city of the world, which must necessarily look to its suburbs to absorb the rapidly increasing population, the public interest demands that such action be invalidated" he argues.

When the lot-size minimums were raised to four acres. The commission failed to show that the former two-acre limitations were "not adequate to protect the health, safety and welfare of the citizenry," the owner contends.

"We submit that the time has arrived when this court should set down the guideposts which serve to keep municipal zoning authorities within the bounds of the police power in this expanding area of zoning law," he adds.

Fights between land developers and communities have grown more numerous and bitter since World War II. Most of the battles have involved homebuilders whose large developments later called for heavy outlays for new schools and other services. This usually means progressive increases in local tax rates.

Yet encouragement of industrial or commercial developments—good sources of tax revenue—frequently meet with strong community opposition. Zone changes that discourage new industry or limit the size and type of business, are one result of such opposition.

But action to stem the growth of housing developments takes many other forms as well. Some localities have limited the number of homebuilding permits granted within a single year. Others have required donation of land for schools or recreational facilities. A few demand payment of a stipulated sum for each house constructed by a builder. The money thus obtained helps defray the cost of constructing schools.

A Chicago suburb adopted such an ordinance, but a county circuit ruled it invalid (ENR July 31, 1958, p. 74). The law, which required a homebuilder to pay $300 for each house constructed, was adopted in 1954. Several other communities followed suit, but the 1958 court decision turned the tide.

Rationing of building permits has also been attempted. One such regulation was adopted by the Town Board of New Castle, a White Plains, N. Y., community. That ordinance was ruled illegal by a state court (ENR Oct. 31, 1957, p. 17).

Canadian Grade-Marking Rules Set

The Federal Housing Administration last weekend announced some temporary measures designed to make it easier for suppliers and builders to adapt to its new grade-marked lumber requirement (ENR Nov. 19, 1959, p. 41).

To insure the compliance of Canadian producers, FHA made an agreement with Canada that will keep the door open to Canadian framing and sheathing lumber for FHA-inspected houses.

This pact will permit lumber graded and marked in accordance with existing standards of Canada's nine principal producing associations to be accepted on the same basis as U. S.-graded lumber when the new requirement goes into effect April 1.

But by September 1, Canadian lumber must be grade-marked under uniform Canadian standards similar to those of the American Lumber Standards Committee.

The FHA agreement calls for creation of a counterpart Canadian Lumber Standards Committee under the Canadian Standards Association to qualify and supervise grade-marking.

The agency has had mandatory grade-marking in 12 of its 75 areas for some time. The current changeover to grade-marking for the entire country is just an extension of an FHA local office practice.

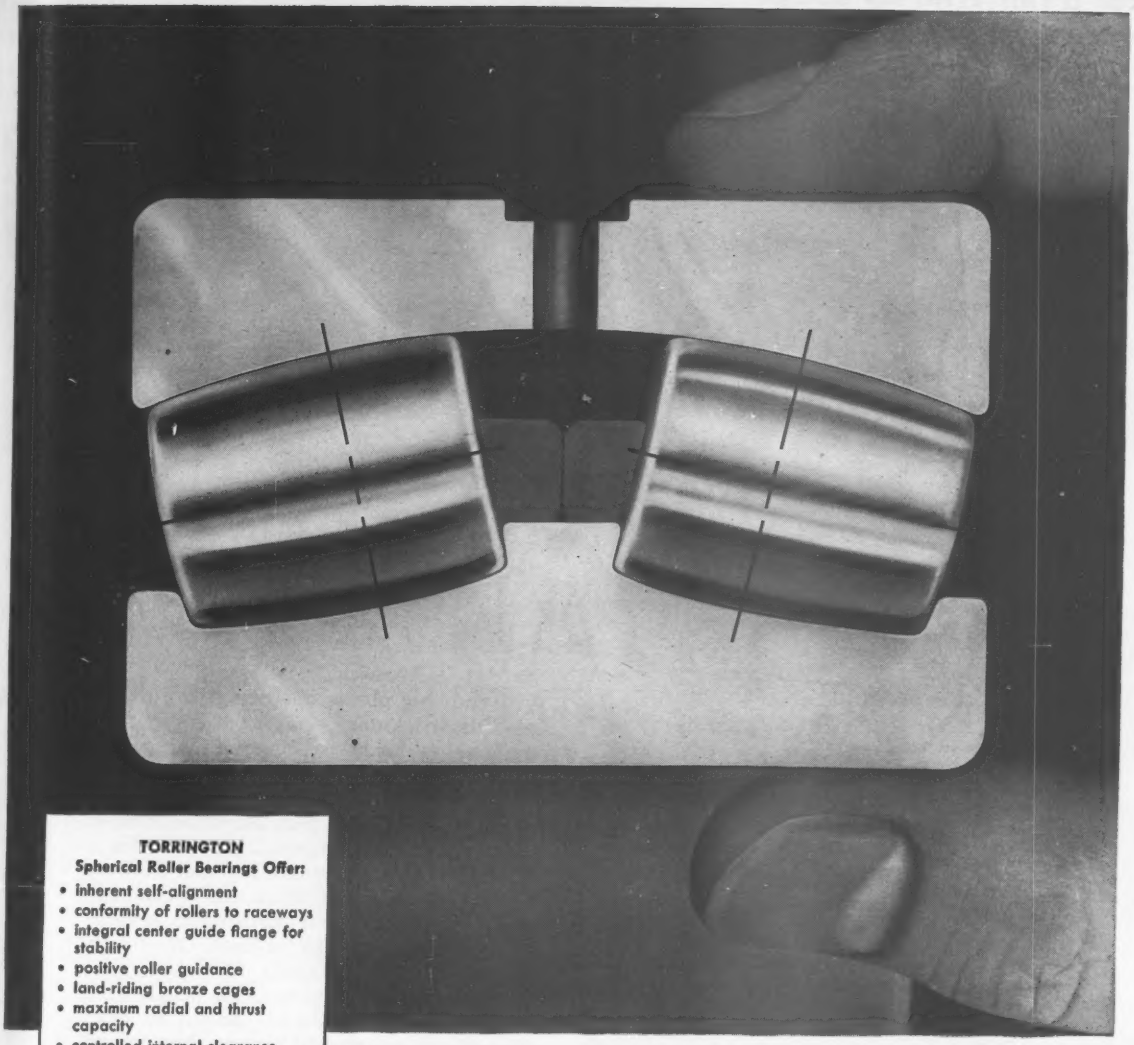
Lumber dealers who are worried about unmarked stocks they may have on hand when April 1 rolls around may find some consolation in a letter of instruction, telling the field directors how to apply the new rule. It leaves several avenues open for use of unmarked lumber after April 1 even on FHA houses.

For example, any house built after April 1 under an FHA mortgage insurance commitment that was made before the letter of instruction reached the field office can go up on the old basis, using unmarked lumber. Houses that have had their first FHA inspection of footings prior to April 1 similarly will require no grade-marked lumber.

These two groups of FHA-inspected houses will amount to several thousands. In addition there will be the vast and continuing volume of conventionally financed housing, free from any FHA grade-marking requirement. Anyway, lumber dealers can look for no let-up in demand for commercial, industrial and public works construction.

Eventually FHA's grade-marking requirement will dominate the entire market, and nearly every stick of lumber handled through major distribution channels will be grade-marked at the mill. That has been the goal of the government and the lumber industry in advocating nation-wide uniform grade marking.

Governing boards of both the National Lumber Manufacturers Association and the National Retail Lumber Dealers Association last November approved FHA's proposed order. There are members of both organizations who disagree, but leaders of the industry are convinced that grade-marking protection for the consumer will benefit the producers and dealers as well.



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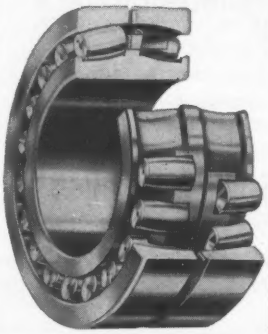

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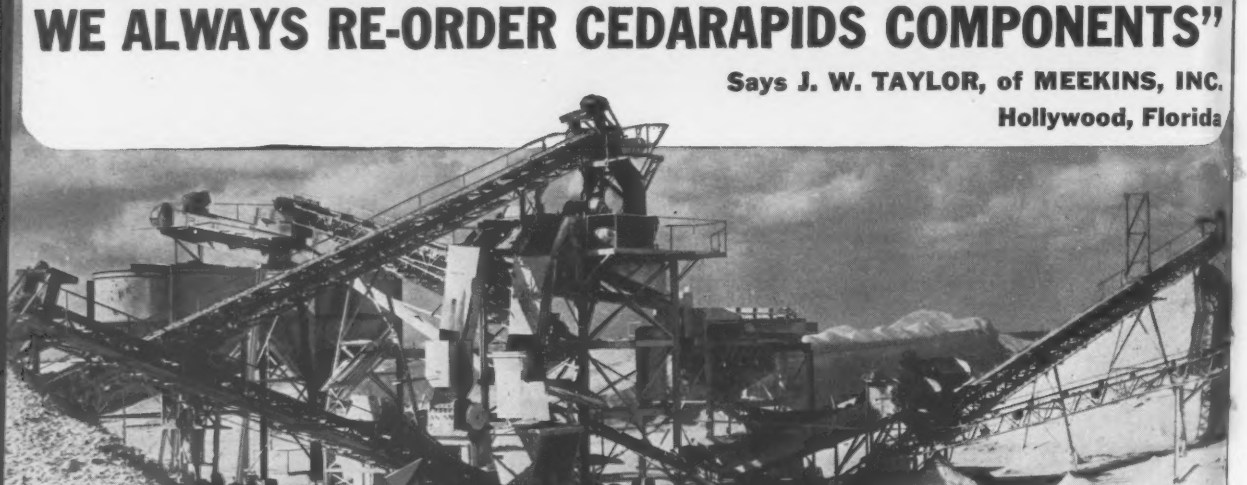

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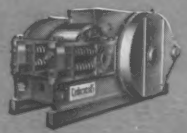

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Labor Presses for T-H Change

- **AFL-CIO groups ask congressional leaders to fulfill their promise of action on a boycott exemption for construction workers.**

- **And as labor presses its demand, a new NLRB ruling shows how complicated the secondary boycott problem is.**

The push is on for a limited construction industry exemption from the present secondary boycott ban.

The building trades unions "are entitled to prompt relief from a harsh and discriminatory situation." That's what AFL-CIO President George Meany told the federation's three-day legislative conference in Washington, D. C., last week. And top political figures from both parties agree with him.

Strongly opposed are a number of employer organizations, including the Associated General Contractors, National Association of Home Builders and the Chamber of Commerce.

The relief, which the building trades have sought for years, would take the form of an amendment to the Taft-Hartley Act. Two such bills—S-2643 and H.R.-4362—are now pending in Congress with bipartisan support.

Object of the amendment, Mr. Meany said, "is to overturn the Denver Building Trades decision (see story this page) and permit building trades workers to picket on the site of a construction project just as a group of factory workers are entitled to picket in front of a plant without being subjected to secondary boycott penalties."

The AFL-CIO construction unions have been trying for eight years to get congressional reversal of the Denver case "so that union building tradesmen will no longer be compelled to work side by side with nonunion building tradesmen on the same job."

Meanwhile, subsequent rulings and the Landrum-Griffin law have made the legal aspects quite complicated.

Most dramatic illustration has just come from the National Labor Relations Board under the prodding of the Fourth Circuit Court of Appeals and the Supreme Court.

Winding up five years of litigation over union and contractor efforts to improve construction labor relations in Baltimore, Md., the board has made this ruling:

A strike to get a subcontractor clause in a labor contract that would make the Denver situation impossible is a violation of the boycott ban.

Genesis of the case was a 1955 strike against Selby-Battersby & Co. The company had refused to go along with an initially successful labor stabilization plan in which most of the Baltimore construction unions and more than 400 general and specialty contractors were then participating. The plan was a joint effort to overcome strikes, lockouts, wasteful work practices and hit-or-miss wages and working conditions. Backbone of the plan was a standard labor agreement to which all the plan participants subscribed.

The legal battle arose over one clause in the agreement—an explanatory provision stating that union workers could not be required to work on any job on which nonunion construction workers were employed. Effect of the clause, was to induce union generals and subs to do business only with each other.

The validity of the clause itself was never tested, and such clauses are now sanctioned by the construction industry's hot-cargo exemption in the Landrum-Griffin law. Yet a strike to get such clauses into a contract is a secondary boycott, the board says, because the effect is the same as the Denver Building Trades case.

This conclusion, however, only scratches the surface of the boycott issue's complexity.

In the Baltimore case, the board said the standard agreement, and the strike to get it, were integral parts of a union organizing campaign that sought to curtail open shop operations and to impose an illegal closed shop.

Result, it said, was that the union activity violated the right of nonunion workers to join or not to join a union. And it forced nonunion employers to violate the law by bargaining with unions that did not represent the workers. What amounted to a demand for a closed shop, it added, also amounted to an unlawful refusal to bargain. The council was held responsible for all this as "joint venturer with and agent of" the local unions.

To Congressmen and industry members involved in the current legislative debate, the Baltimore case is significant in three respects:

- It indicates that Congress short-changed labor unions in the Landrum-Griffin hot-cargo exemption by granting a right that cannot be demanded or enforced.
- When added to the Denver Building Trades case, it means that union

(*Story continued p. 83*)

. . . Background on the Denver Case

The Denver Building Trades case was decided by the U.S. Supreme Court on June 4, 1951.

It arose on a secondary boycott charge against the Denver Building and Construction Trades Council.

The council had picketed a commercial building project because the general contractor, who employed union workers, hired a nonunion electrical subcontractor. The project was shut down until the subcontractor was discharged.

The council contended its aim was to make the job all union and that the dispute was a primary one with the general. But the court ruled 6 to 3 that an illegal secondary boycott automatically existed because one object of the strike was to force the general to quit doing business with the sub.

The court reasoned the only way the job could be protected was by forcing the sub's discharge. The separate legal entities of the employers, it said, denied the general any control over the sub's employees.

Justice Douglas, in the dissent, said the decision ignores "realities."

He argued that such a "fortuitous" business arrangement as subcontractor status should not make an otherwise legal strike illegal, and urged that the boycott ban be applied only to a dispute that "spreads from the job to another front."

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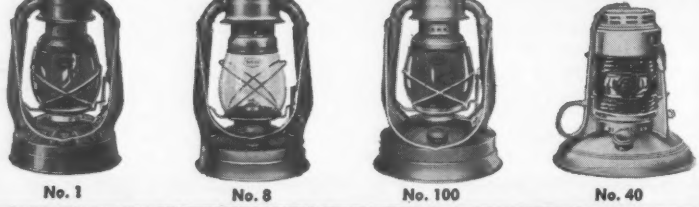

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construction workers, unlike industrial workers, have no effective way to protect their wages and working conditions by refusing to work alongside nonunion men performing the same type of work. The new seven day union shop authorization is not an answer to this situation because of the legally independent entities of the various employers often engaged on the same job.

• The decision helps to explain such typical contractor objections to a boycott exemption as back-door organizing, closed shop practices, roadblocks to the introduction of new products and materials, more strikes and higher costs.

Inextricably related to these problems are several ponderous questions. Is the Taft-Hartley Act fair to construction workers? Can it really be patched up? Where is the primary dispute in a typical construction boycott? Are there any neutral employers in such a situation? Would a boycott exemption be fair to general contractors who have no control over subcontract awards?

President Eisenhower, Labor Secretary Mitchell and even Sen. Barry Goldwater (R., Ariz.) have urged reversal of the Denver case on the grounds that all employers at a construction site realistically are partners in a common enterprise. Because of the absence of any neutrals, the reasoning goes, a labor dispute with one is a dispute with all, and none is entitled to be shielded.

As a result of the compromise that assured passage of the Landrum-Griffin law, Congressional leaders are pledged to early consideration of the proposed boycott exemption.

Labor, quite aware that 1960 is an election year, expects them "to redeem" the pledge.

Unions Will Ask Congress To Upset Brown-Olds Rule

The AFL-CIO Building and Construction Trades Department has scheduled its Sixth Annual National Legislative Conference for March 14-17 in Washington, D. C.

Department's legislative program includes:

• Reversal of the Denver Building Trades case (secondary boycotts).

• Modernization of the Davis-Bacon Act (prevailing wages).

• A comprehensive school aid and construction law.

• A comprehensive housing law.

• Taft-Hartley amendments to reverse the Brown-Olds rule (the labor board's reimbursement remedy for hiring violations), eliminate the mandatory injunction provision and repeal Section 14(b), which allows states to pass right-to-work laws.

Ban on Hot-Cargo Clauses Upheld

The Landrum-Griffin ban on hot-cargo clauses has been ruled constitutional, and a union effort to circumvent the ban has been thwarted by the Federal District Court in San Francisco.

Judge William T. Sweigert granted a National Labor Relations Board request last week for an injunction to prevent a lithographers local union from striking for inclusion of the controversial clause in a labor contract.

Stuart Rothman NLRB general counsel, said the case is the first legal test of the new restrictions on hot-cargo clauses. The union plans to appeal.

If the decision sticks, it will directly affect use of similar clauses in the construction industry.

Such clauses have historically been part of the lithographer's contract. Until passage of the Landrum-Griffin law, it was normal for the contract to contain clauses barring the handling of work from a nonunion shop or from a struck shop of the same employer. The new law bans such clauses, except in the clothing and construction industries. But in construction, the clause must relate to contracting or subcontracting of work to be done at the construction site.

The lithographers union tried to get around the ban by rewording the clause. Under the proposal for which the union was striking, the contract would automatically be opened for renegotiation if union members were asked to handle hot-cargo. A strike could then result and union refusal to handle hot-cargo could be achieved.

Had the court approved the union's demand, the same approach would have been available to construction unions seeking restrictive clauses not clearly within the industry's on-site exemption. The plumbers' fabrication clause falls into this category.

The Landrum-Griffin ban is a "lawful exercise by Congress of the commerce power," the court said, and the economic and practical problems to which the clothing and construction exemptions relate prevent the ban from being unconstitutionally discriminatory.

The decision allows the union to continue its strike for other demands.

Electricians Try to Trim Costs

Contractors and union members in the electrical industry of metropolitan New York City are developing ways and means to prevent the increase in labor costs under a new labor agreement from being passed on to the public.

The program is an integral part of a two-year contract that grants a 25-cent hourly wage increase each year. Negotiated under the auspices of the Joint Industry Board of the Electrical Industry, the agreement affects 10,000 members of IBEW Local 3 and 600 employers in five boroughs.

Agreement has been reached on a statement of intent to be incorporated in the contract committing both contractors and union members to cooperate in the development of economies. These will not be spelled out in the contract.

Among the goals being mentioned are a job stagger system to prevent jamups on elevators, the cooperation of jobbers and manufacturers in the packaging and delivery of materials to facilitate immediate use and to reduce multiple transportation costs, and reduction of abuses in—but not elimination of—coffee breaks.

Joint union-contractor meetings with superintendents and foremen are now underway, and on-the-job seminars and university and union school programs are contemplated to stimulate cost-conscious attitudes in workers and employers.

The contract became effective January 1. It raised the union wage scale from $3.90 to $4.15 an hour and will push it to $4.40 next year. Fringe benefits add another 30% to the contractors' labor costs.

Court Denies Travel Pay To Paducah Carpenters

A Kentucky court has ruled that carpenters who worked on the billion-dollar atomic plant near Paducah are not entitled to back travel pay.

The suit, which involved an estimated $750,000, was filed by the carpenters' Paducah local against F. H. McGraw.

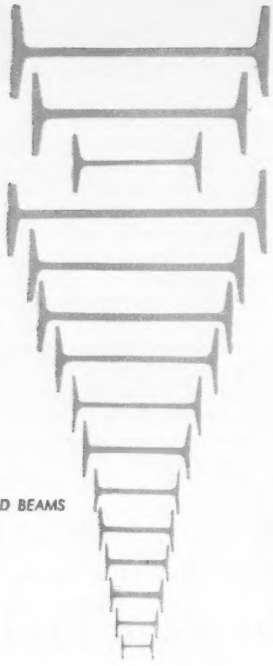
The union claimed members were entitled to $1 a day in travel pay from January 1951 to February 1953 under an area practice to which, it said, McGraw had agreed to conform.

The court found no evidence of such an area practice and noted that the contractor, under a cost-plus contract, could pay only those wages authorized by the Atomic Energy Commission.

Carpenter attorneys plan to appeal.

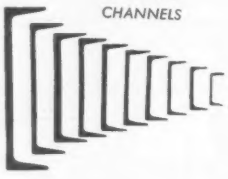
(*Labor continued p. 86*)

You've got plenty to work with when you design with structural steel

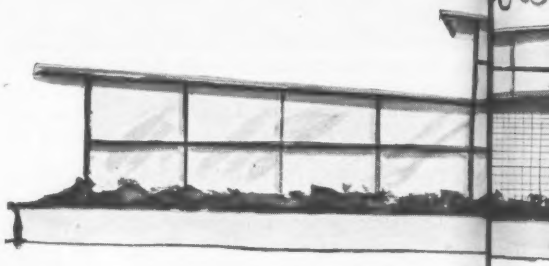


STANDARD BEAMS

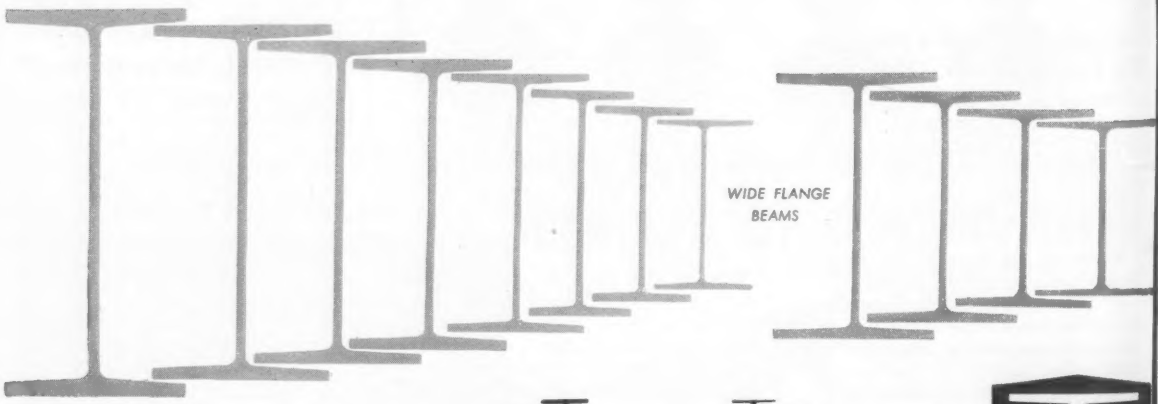
And it's all quickly available through your local steel fabricator. Not only the standard shapes you see here, but many specials as well. What's more, your fabricator is a regular Houdini when it comes to fabricating these shapes to meet your most intricate designs. He works his magic fast, too, to assure *prompt* delivery. And he's a good man to know when you're looking for sensible solutions to thorny problems. Call him in on your next job. You'll be glad you did.



STANDARD CHANNELS



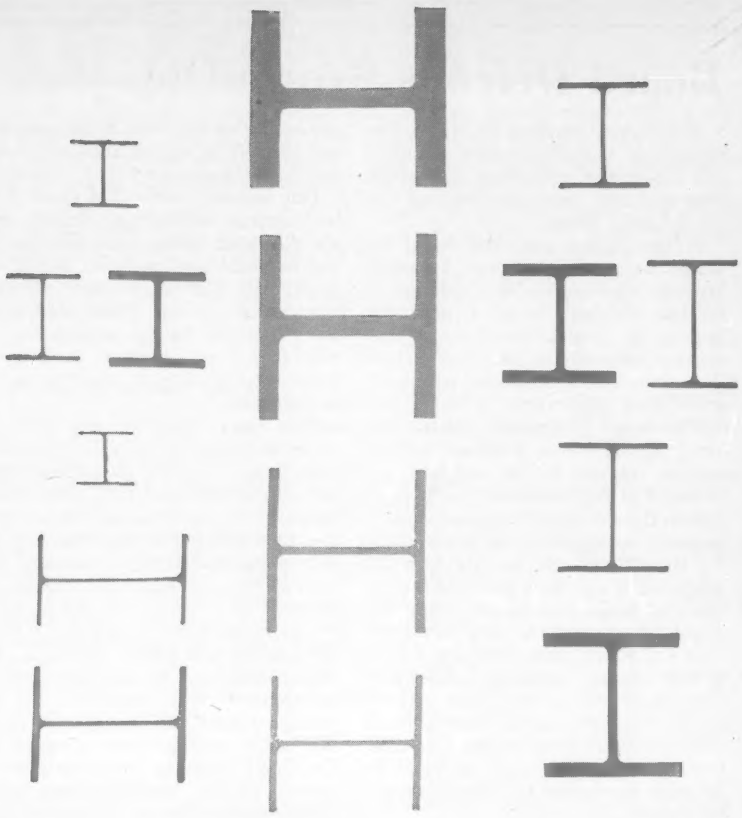
SHIP AND CAR BUILDING SECTIONS



WIDE FLANGE BEAMS

LIGHT BEAMS AND COLUMNS

BETHLEHEM STEEL



COLUMNS

ANGLES

WIDE FLANGE BEAMS

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Board Defends Brown-Olds Rule

Illegal hiring practices are still "widespread" in the construction industry, and unions and contractors can expect little sympathy from the National Labor Relations Board.

In two recent cases the board repeated these earlier warnings: Financial hardship is no defense to a violation of the law; an illegal hiring arrangement cannot go unpunished—even if the workers were union members before their employment began and paid their union dues voluntarily.

The board continues to insist that hiring arrangements, whether oral or written, conform to the standards established in the Mountain Pacific case. And in the absence of "unusual circumstances," it will punish offenders under the Brown-Olds rule by making them cough up union dues and assessments collected from all employees while the illegal hiring practices were in effect.

In one of the cases, involving a local of the laborers union and Knowlton Construction Co., the board refused to hear testimony on the financial hardship the union would suffer from the remedy. It said this was irrelevant to the issue of whether the remedy should be applied.

Taking the same tack in another case, it ruled that evidence of hardship should be reserved for the compliance stage of the proceeding.

In the second case, which stemmed from an illegal hiring arrangement between a local of the plumbers union and Lummus Corp., the board also demolished two other arguments against imposition of the Brown-Olds remedy and refused to receive testimony supporting the arguments.

One was that payment of union dues by Lummus workers was voluntary and not the result of correction inherent in the unlawful and exclusive hiring arrangement. The board's reply was that any exclusive hiring clause that lacks the Mountain Pacific safeguards "inevitably coerces employees to become union members and to make payments to the union."

The other argument was that all Lummus employees from the union had been union members long before they were hired and were thus required to remain union members and to pay dues under a lawful union shop clause. If so, the payments forfeited under the Brown-Olds rule were dues legally received.

The board, however, said that even if the workers had joined the union for reasons unrelated to the illegal hiring arrangement, "we would still not be precluded from finding, as we do here, that such members were coerced by the illegal clause to retain their membership (in the union) at least while seeking employment with Lummus, and before the maintenance of membership clause applied to them."

A strong case can be made for the use of the Brown-Olds remedy, the Board said, simply because it is more effective than a cease and desist order. Not only is it a deterrent to future violations, the Board added, but it is also an incentive to future compliance.

Labor in Brief . . .

• **It's not inflationary**—Labor Secretary Mitchell says reports on the cost of the new steel contract are "misleading." He claims the pact is not inflationary, that the wage increases are in line with others recently negotiated. Meanwhile, resulting price increases in several unrelated industries pose the question of who's responsible—labor or management—if the pact becomes inflationary.

• **Seeks higher wage floor**—The Arkansas State AFL—CIO is seeking a statewide popular vote in November on a proposed minimum wage law. Proposal calls for 80 cents an hour the first year, 90 cents the second and $1.00 thereafter.

• **Union investment**—A union pension fund is taking a $3.7-million mortgage on a Virginia motor hotel. It is under construction on a five-acre tract made available in Norfolk's slum clearance and redevelopment. Fund is the teamster's Southeast and Southwest Areas Employer-Employee Pension Fund.

• **Win wage increase**—The Associated General Contractors of Wyoming has negotiated a new two-year labor contract that gives 4,000 operating engineers in the state a wage boost of 24 cents an hour. Increase is payable in four six-cent installments at six-month intervals. Crane operators get $2.34-$3.30.

OFFICIAL PROPOSALS

Bids: February 24, 1960

Narrows Bridge—Brooklyn Tower & Staten Island Tower

TRIBOROUGH BRIDGE AND TUNNEL AUTHORITY

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 A.M. Wednesday, February 24, 1960

For Narrows Bridge Contract No. NB-2B, Brooklyn Tower. The bid must be accompanied by a deposit in the amount of $250,000.

and

For Narrows Bridge Contract No. NB-2S, Staten Island Tower. The bid must be accompanied by a deposit in the amount of $250,000.

Bidders may submit bids for either one or both of the above contracts.

Plans, specifications and contract documents may be purchased at the office of the Authority for $25.00, which will not be refunded.

Bids: February 16, 1960

George Washington Bridge Bus Station Sale and Erection of Structural Steel

THE PORT OF NEW YORK AUTHORITY
CONTRACT GWB-200.012

Sealed proposals for the sale and erection of structural steel for the George Washington Bridge Bus Station adjacent to the New York Plaza of the George Washington Bridge will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y. until 2:30 P.M. on Tuesday, February 16, 1960, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, January 21, 1960

Tapakuma Project

GOVERNMENT OF BRITISH GUIANA
Notice to Tenderers

The Government of British Guiana intends to invite tenders for the construction of irrigation and drainage works in an area of about 35,000 acres on the Essequibo Coast. The works comprise earthworks in embankments, canals and drains, the construction of regulators and the construction of a small dam and a pumping station of 200 cusecs capacity.

Contractors who would be interested in the invitations to tender should send particulars of their overseas experience on similar works to the Consulting Engineers, Sir William Halcrow & Partners, Alliance House, Caxton Street, London, S.W. 1.

OFFICIAL PROPOSALS

Bids: January 28, 1960.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Public Buildings Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M., eastern standard time on the 28th day of January 1960, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. NICKERSON, District Engineer, 353 Broadway, Albany 1, New York						
Rensselaer (Rte. 40)	FARC 60-4	Schaghticoke-Schaghticoke Hill, S.H. 477 Melrose-Schaghticoke Hill, S.H. 1425A Project F-504(10)	0.52	8" Cem. Conc. Pavt. 24' Wide = 0.49 Mi. Misc. Work = 0.03 Mi. Prestressed Conc. Beam Br. 125'	$21,000 Plans $5	$376,000
Schenectady (Rte. 159)	FARC 60-6	Mariaville-Montgomery Co. Line, S.H. 789 Project F-1024(2)	0.03	Asph. Conc. Pavt. = 0.02 Mi.; Misc. Work = 0.01 Mi. Corr. Multiplate Arch Br. 20.8' Span	$4,800 Plans $5	87,000
Warren	M60-1	Brayton Ave: Canal Bridge over Glens Falls Feeder	....	Strengthening Exist. I-Beam Bridge	$500 Plans $10	8,700
DISTRICT No. 2, L. KETCHUM, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Oneida	M60-2	Roberts Bridge over Erie Canal Br. E-61, Verona, New York	....	Clean. & Paint. 1 Bridge	$200 Plans $10	3,400
DISTRICT No. 3, EARLE E. TOWLSON, Acting District Engineer, 333 E. Washington Street, Syracuse, New York						
Oswego	U. S. 101	Lock 0-7, Oswego Canal City of Oswego	....	New Gates, Lowering Upper Sills and Misc. Work	5% of Bid Plans $10	(Confidential)
Oswego	U. S. 103	Lock 0-6, Oswego Canal City of Oswego	....	New Gates, Lowering Lower Sills and Misc. Work	5% of Bid Plans $10	(Confidential)
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Monroe (Rte. 104)	FAC 60-1	Rochester City-Ridge Road West (Kodak Bridge and Approaches) Project UG-402(9)	0.10	Asph. Conc. Type 2A Pavt. = 0.09 Mi. Misc. Work = 0.01 Mi. R.R.G.S., Comp. I-Beam 60.74'	$10,000 Plans $5	188,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Cattaraugus (Rte. 18)	FARC 60-25	Bradford-Carrollton, Pt. 1, S.H. 8007 Bradford-Carrollton, Pt. 2, S.H. 8018 & 8018A Bradford-Carrollton, Pt. 3, S.H. 8144 Project F-30(5)	6.78 (2.75 Acc.)	9" Cem. Conc. Pavt. 24' Wide = 6.04 Mi. Asph. Conc. Pavt. = 0.74 Mi. (Access Rds. = 2.75 Mi. Asph. Conc. Pavt.)	$145,000 Plans $5	2,653,000
Cattaraugus (Rte. 242)	FARC 60-9	Little Valley-Randolph, Pts. 1 & 2, S.H. 8149 Little Valley-Randolph, Pt. 3, S.H. 5258A Project F-603(9)	4.67	Asph. Conc. Pavt. = 4.65 Mi. Misc. Work = 0.02 Mi. Corrug. Plate Twin Arch Bridge 36'	$47,000 Plans $5	851,000
Niagara	FAC 60-14	City of Niagara Falls: Hyde Park Boulevard (B Street to Jerauld Avenue) Project U-1128(2)	1.95	Asph. Conc. Pavt. = 1.88 Mi. Misc. Work = 0.07 Mi. Extension of R. C. Twin Box Br. 24'	$100,000 Plans $5	1,837,000
Niagara	FASS 60-1	Lockport Road (County Road No. 132) Project S-528(2)	3.05	9" Unreinf. Cem. Conc. Pave. 24' Wide = 2.96 Mi. Misc. Work = 0.09 Mi.	$35,000 Plans $5	629,000
DISTRICT No. 6, J. H. THOMAS, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Steuben (Rte. 17)	FARC 60-7	Painted Post-Addison, Pt. 2, S.H. 5094 Painted Post-Addison, Pt. 3, S.H. 5349 Project F-593(11)	3.97	Asphalt Concrete Pavement	$28,000 Plans $5	509,000
DISTRICT No. 7, R. W. SWEET, District Engineer, 444 Van Duzee Street, Watertown, New York						
Jefferson & Lewis (Rte. 12)	FARC 60-3	Burrs Mills-South Champion, S.H. 626 Lewis Co. Line-South Champion, S.H. 1129 Copenhagen, S.H. 937 Project F-1043(4)	1.50	Asph. Conc. Type 1A Pavt. = 1.38 Mi. Misc. Work = 0.12 Mi.	$20,000 Plans $5	397,000
St. Lawrence (Rte. 345)	FARC 60-5	Madrid-Waddington, Pt. 1, S.H. 1262 Madrid-Waddington, Pt. 2, S.H. 966 Waddington Village, S.H. 1125 Project S-110(2)	8.30	Asph. Conc. Type 1A Pavt. = 8.26 Mi. Misc. Work = 0.04 Mi.	$75,000 Plans $5	1,364,000
DISTRICT No. 8, K. G. RAUER, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
ORANGE (Rte. 17K)	RC 60-8	Bloomingburg-Bullville, S. H. 8166	0.35	Asph. Conc. Pavt.	$3,600 Plans $5	65,000
DISTRICT No. 9, J. C. FREDERICK, District Engineer, 71 Frederick Street, Binghamton, New York						
Broome (Rte. 369)	FARC 60-10	Chenango Towpath, S.H. 175 Port Crane-North Fenton, S.H. 963 Project S-815(2)	6.48 (0.21 Acc.)	Asph. Conc. Pavt. Repair Exist. Br. No. 1 Corrug. Plate Twin Arch Br. 25' Comp. W.F. Beam Br. 104.5'	$85,000 Plans $5	1,497,000
Delaware, N. Y. & Wayne, Penn.	I. Br. 60-1	Lordville Interstate Suspension Bridge (Ch. 360 Laws 1936)	0.08	Repairs & Alterations (4" Timber Deck)	$800 Plans $5	15,000
DISTRICT No. 10, M. E. GOUL, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Kings (Int. Tour. Rte. 278)	FIGE 60-1	Interstate Route Connection 512, Gowanus Expressway (36th Street to 53rd St.) Project I-U-278-1(46)	0.84 (1.48 Acc.)	Reinf. Conc. Roadway (on Viaduct) = 0.82 Miles Misc. Work = 0.02 Mi. Sheet Asph. Pavt. (Streets and Ramps) = 1.42 Miles; Cem. Conc. Pavt. (Ramps) = 0.06 Mile; Steel Elevated (Viaduct) Struct. 83 Sp. 4,322.5'	$700,000 Plans $10	12,667,000
Nassau & Suffolk	FARC 60-2	Mineola Village-Jericho Turnpike, S.H. 1785 Wantagh-Central Park, Pt. 3, S.H. 42-3, Massapequa-Glen Cove, S.H. 9017; Coram-Middle Island East, S.H. 8291 Project F-1000(8); F-488(5); S-212(3); S-377(4)	2.54	Drainage & Misc. Work	$50,000 Plans $5	912,000
Nassau (Rte. 25)	FASH 60-20 FARC 60-12	Jericho Turnpike-Floral Park Village Jericho Turnpike, S.H. 9020 Project U-1000(3)	0.76	Demolition of Buildings	$16,000 Plans $5	297,000
New York	FAHRD 60-1	Harlem River Drive (Contract No. 139A) (143rd Street to 145th Street and 153rd Street to 155th Street) Project U-1133(6)	0.35	9" Cem. Conc. Pavt. with Carb. Black = 0.13 Mile Asph. Mac. Pavt. = 0.15 Mi.; Asph. Conc. Pavt. = 0.07 Mi. Rehabilitating Macombs Dam Bridge	$50,000 Plans $5	896,000
New York (Int. Tour. Rte. 95	FICBE 60-1	Interstate Route Connection 511 (Cont. 3) Cross Bronx Expressway (Highbridge Interchange) Project I-95-1(36)	0.13	9" Cem. Conc. Pavt. 26' Var. Wide = 0.09 Mi.; Misc. Work = 0.04 Mi. Highbridge Interchange Ramps; 3 Hy. Sups. Plate Girders 385', 411 'and 317'; Rehabilitating Struct. No. 20 Plate Girder; Misc. Work on Alexander Hamilton Bridge	$180,000 Plans $10	3,313,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1959, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

District of Columbia—Highway Construction—Dept. of Highways & Traffic, December 30, 1959. CONSTRUCTING THE ANACOSTIA FREEWAY-BRIDGE OVER OXON RUN BAY, FEDERAL AID INTERSTATE PROJECT NO. I-295-2(17)0—Invitation No. C-6060-H, consisting of approximately the following quantities: 2,650 cu. yds. Class BB Concrete; 1,570,000 lbs. Reinforcing and Structural Steel; 13,670 lin. ft. Steel "H" Beam Piles and 1,630 cu. ft. Stone Masonry Facing (Minimum wage rates for this project have been predetermined by the U. S. Department of Labor, as required by law. They are included in Addendum No. 1 which will accompany the specifications.) Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Pennsylvania Avenue, N.W., upon deposit of a certified check for $20.00 per set, payable to the D. C. Treasurer (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EST, February 3, 1960, in Room 424, 499 Penn. Ave., N.W.

District of Columbia—Highway Construction—Dept. of Highways & Traffic, January 4, 1960. WASHINGTON CHANNEL BRIDGE SUBSTRUCTURE AND GRADING, Federal Aid Interstate Project No. I-95-1 (27) 1, consisting of approximately 97,060 cu. yds. backfill and fill, 72,500 lin. ft. cast-in-place concrete friction piles, 13,961 cu. yds. concrete in tunnel, piers, abutments and walls, 1,670,500 lbs. reinforcing steel, and 27,400 cu. ft. Class B stone masonry facing (Invitation No. C-60107-H). The wage rates for this interstate project have been predetermined by the Labor Department. On January 21, 1960, at 2:00 PM, EST, in Room 500, District Building, 14th & E Streets, N.W., Washington 4, D. C., a pre-bid meeting will be held to answer questions bidders may have on the project. Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Pennsylvania Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EST, February 1, 1960, in Room 424, 499 Penn. Avenue, N.W.

Bids: February 15, 1960

Furnishing Materials & Performing Labor For Constructing Gravity Sewers

Notice is hereby given that sealed bids will be received in accordance with the law by the Ewing-Lawrence Sewerage Authority, until two o'clock P.M., Eastern Standard Time on the fifteenth day of February, 1960, at the office of the Authority, 600 Whitehead Road, Trenton, New Jersey, for furnishing materials and performing the labor for constructing eight (8") inch gravity sewers with house connections, all in accordance with plans and specifications prepared by Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, New York.

Copies of the plans and specifications may be obtained either from the Authority or from the Consulting Engineers upon deposit of Fifteen ($15.00) Dollars, which sum will be refunded upon return of the plans and specifications in good condition within twenty (20) days after the date on which bids are received or else the entire deposit will be forfeited.

The work to be performed consists of furnishing and installing approximately three thousand one hundred (3,100') lineal feet of eight (8") inch sewer pipe and appurtenances, together with approximately five hundred and eighty (580') lineal feet of six (6") inch sewer pipe and appurtenances for house connections. Each proposal must be accompanied by a certified check payable to the Ewing-Lawrence Sewerage Authority or bid bond from a reliable surety company authorized to do business in the State of New Jersey and satisfactory to the Authority, in amount equal to ten (10%) percent of the proposal. The certified checks will be retained to pay for any damage or loss to the Authority, or the liability bond will accrue, in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal.

Each proposal must be accompanied by an agreement of a surety company qualified to do business in the State of New Jersey in the amount of such proposal, which agreement shall bind the surety company that if the contract be awarded the bidder it will, upon the contract being awarded, become surety for the faithful performance of said work. Said agreement shall be in writing and in the form of surety guarantee provided. The successful bidder will be required to furnish the statutory performance bond in the amount of his bid, approved as to form by the Authority counsel and as to sufficiency by the Authority.

The Authority reserves the right to consider bids for thirty (30) days after their receipt before awarding any contract and the right is reserved to accept any bid or to reject any or all of them.

EWING-LAWRENCE SEWERAGE AUTHORITY
Wilfred F. Predhome (Chairman)
Joseph T. Barber (Vice Chairman)
Philip A. Smith (Treasurer)
John G. Brady (Secretary)
John E. Malone
Stephen J. Krol
Buck, Seifert and Jost
Consulting Engineers
Dated: January 18, 1960

Bids: February 15, 1960

Furnishing Material & Performing Labor For Constructing an Intercepting Sewer

Notice is hereby given that sealed bids will be received in accordance with the law by the Ewing-Lawrence Sewerage Authority until two o'clock P.M. Eastern Standard Time on the fifteenth day of February, 1960 at the office of the Authority at 600 Whitehead Road, Trenton, New Jersey, for furnishing materials and performing the labor for constructing an intercepting sewer in accordance with the plans and specifications prepared by Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, New York.

Copies of the plans and specifications may be obtained either from the Authority or from the Consulting Engineers at their New York office upon deposit of Twenty ($20.00) Dollars, which sum will be refunded upon return of the plans and specifications in good condition within twenty (20) days after the date on which bids are received or else the entire deposit will be forfeited.

The work to be performed consists of furnishing and installing approximately four thousand two hundred and sixty (4,260') lineal feet of eight (8") inch, two thousand five hundred and ninety (2,590') lineal feet of twelve (12") inch, two thousand four hundred and eighty-five (2,485') lineal feet of fifteen (15") inch and nine thousand and ninety (9,090') lineal feet of eighteen (18") inch pipe and appurtenances.

Each proposal must be accompanied by a certified check payable to the Ewing-Lawrence Sewerage Authority or bid bond from a reliable surety company authorized to do business in the State of New Jersey and satisfactory to the Authority, in amount equal to ten (10%) percent of the proposal. The certified checks will be retained to pay for any damage or loss to the Authority, or the liability bond will accrue in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal.

Each proposal must be accompanied by an agreement of a surety company qualified to do business in the State of New Jersey in the amount of such proposal, which agreement shall bind the surety company that if the contract be awarded the bidder it will, upon the contract being awarded, become surety for the faithful performance of said work. Said agreement shall be in writing and in the form of surety guarantee provided. The successful bidder will be required to furnish the statutory performance bond in the amount of his bid, approved as to form by the Authority counsel and as to sufficiency by the Authority.

The project will be financed in part by a grant-in-aid from the United States Government under the provisions of Public Law 660, Water Pollution Control Act Amendments of 1956.

The Authority reserves the right to consider bids for sixty (60) days after their receipt before awarding any contract or for such longer period as may be required to obtain the necessary approval of award by the United States Public Health Service and the right is reserved to accept any bid or to reject any or all of them.

EWING-LAWRENCE SEWERAGE AUTHORITY
Wilfred F. Predhome (Chairman)
Joseph T. Barber (Vice Chairman)
Philip A. Smith (Treasurer)
John G. Brady (Secretary)
John E. Malone
Stephen J. Krol
Buck, Seifert and Jost
Consulting Engineers
Dated: January 18, 1960

Bids: April 2, 1960.

Tender for Construction of Karmat Beni Sa'ad New Water Supply Scheme

REPUBLIC OF IRAQ
MINISTRY OF MUNICIPALITIES
DIRECTORATE GENERAL OF WATER AND ELECTRICITY
NOTICE NO. 17

TENDER from constituted qualified engineering firms with experience in Public Works of magnitude are invited by the Director General of Water and Electricity, Ministry of Municipalities, for the supply and erection of the clarifying tanks with mechanically operated sludge scrapers, flocculating tanks, flash mixers, alumina dosing apparatus, horizontal rapid pressure filters, air blowers, gaseous chlorinators with platform weighing scales, two electrically operated low lift pumping units, two electrically operated high lift pumping units switch boards, cables, venturi meter and recorder, a welded steel plate elevated service tanks, electrically operated water level recorder, suction main, pumping mains, pump and filter house building overhead gantry crane, electric lighting, sewage disposal system and all other appendages, connections and ancillary Nasiriya works in the New Water Supply Scheme for Karmat Beni Saad Liwa according to the General Conditions and Specification which can be obtained from the Accounts Section of the said Directorate on production of a valid Chamber of Commerce Certificate or from the Embassy of the Republic of Iraq or Legation in foreign countries, on the respective payment of the sum of ID.10/- or (equivalent) for each copy or for two copies.

Tenders should be submitted by registered post in sealed envelopes directly addressed to the Secretary of the Purchasing Committee, Ministry of Municipalities, Baghdad, and marked "Tender for KARMAT BENI SA'AD Water Supply Scheme".

Closing date of Tender—12 Noon on Saturday 2nd April, 1960.

The specifications are also available at the Embassy of Iraq, 2135 Wyoming Ave., N.W., Washington, D. C.

$2.80 is equal to One Dinar.

DIRECTOR GENERAL OF WATER & ELECTRICITY

Bids: February 4, 1960.

New Jersey Turnpike Authority

NEW BRUNSWICK, N. J.
ADVERTISEMENT FOR PROPOSALS
CONTRACT NO. R-56

Proposals are invited for Contract No. R-56 which involves the construction of underbridge slope protection under eleven (11) bridges and the restoration of existing underbridge slope protection under six (6) bridges, all between Mile 20 and Mile 117 of the New Jersey Turnpike.

The principal items of work include:

18" Steel Channel	1,365 Lin. Ft.
Grading and Dressing of Slopes	14,660 Sq. Yds.
Corrugated Metal Pipe	1,804 Lin. Ft.
Belgian Block Gutter Reconstruction	123 Sq. Yds.
Asphaltic Emulsion Compound	418 Gals.

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11:00 o'clock, Eastern Standard Time, on the morning of February 4, 1960, at which time and place said proposals will be publicly opened and read.

Contract documents may be examined during office hours on or after January 18, 1960, at the office of the Authority and will be furnished upon payment of Ten Dollars ($10.00) for each set, not refundable.

NEW JERSEY TURNPIKE AUTHORITY
Joseph Morecraft, Jr., Chairman
January 11, 1960

OFFICIAL PROPOSAL

RATE $2.40 per line (or fraction) per insertion.
CLOSING DATE: 10:30 a.m. Friday for issue out following Thursday.
SEND COPY: Official Proposal Division, Class. Adv. Div.; Engineering News-Record, P. O. Box 12, New York 36, N. Y.

OFFICIAL PROPOSALS

Bids: January 28, 1960.

Notice: Re. Prequalification Forms For Contractors Board of Education Bureau of Construction

BOARD OF EDUCATION—BUREAU OF CONSTRUCTION
APPROVED AS TO FORM
Acting Corp. Counsel

NOTICE IS HEREBY GIVEN THAT The Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y., will receive application for prequalification from contractors who may wish to submit bids for the proposed hereinafter specified contracts as follows: general construction, plumbing and drainage (including heavy kitchen equipment), heating and ventilating, electrical work and lighting fixtures.

BROOKLYN
P.S. 29, Henry Street, bwt. Baltic and Kane Streets. Modernization and Conversion.
P.S. 243, Troy Avenue, bwt. Dean and Bergen Streets. New Building.
P.S. 288, Surf Avenue, bwt. W. 25th & W. 27th Streets. New Building.

RICHMOND
J.H.S. 49, Hill and Warren Streets, Clifton. New Building.

Prequalification application forms will have to be secured from and must be submitted to the Superintendent of Design, Construction and Physical Plant, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y.

Bids when advertised, will be received from prequalified bidders only.

Time for submitting prequalification applications by contractors will expire on Thursday, January 28, 1960.

JOSEPH R. WEISS
Superintendent of Design, Construction and Physical Plant.

Starting: Monday, January 18, 1960.
Five (5) Days.
Dated: January 7, 1960.

U. S. Government

FEDERAL AVIATION AGENCY, Sealed Bids will be received at the office of the Chief, Materiel Contracts Branch, Room 2615, T-5 Building, 16th & Constitution Avenue, Washington 25, D. C., until 2:00 P.M., E. S. T., February 23, 1960, for the construction of the structural portion of the Terminal Building at the Dulles International Airport near Chantilly, Virginia. Plans, specifications and bid forms will be available upon request at the address given above. A deposit of $25.00 will be required for each set of plans and specifications. Refunds will be made for no more than two sets.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5268) will be received at McCook, Nebraska, until 10 a.m., Central Standard Time, February 25, 1960, for furnishing labor and materials for earthwork and structures, Culbertson Extension Canal, Station 1719+00 to Station 2571+36, and laterals, wasteway, and drains, Frenchman-Cambridge Division, Nebraska, Missouri River Basin Project. Location near McCook, Nebraska. Principal items in two schedules are 772,000 cu. yds. excavation; 1,900 cu. yds. concrete in structures; 20,000 lin. ft. concrete pipe; 2,000 lin. ft. corrugated-metal pipe; various metal gates and miscellaneous metalwork; and other work. Completion time 700 days. For particulars, address Bureau of Reclamation, P. O. Box 737, McCook, Nebraska; Building 46, Denver Federal Center, or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5270) will be received at Loveland, Colorado, until 10 a.m., Mountain Standard Time, February 23, 1960, for furnishing labor and materials for Multichannel Microwave Radio Communication System, Flatiron Dispatch Office to Cheyenne Substation, South Platte Transmission Division, Colorado-Wyoming, Missouri River Basin Project. Location between Loveland, Colorado, and Cheyenne, Wyoming. Principal items are complete microwave radio system between Flatiron Dispatch Office and Cheyenne Substation—Lump sum. Completion time 360 days. For particulars, address Bureau of Reclamation, P. O. Box 449, Loveland, Colorado; Building 46, Denver Federal Center; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-5269) will be received at Denver, Colorado, until 2 p.m., Mountain Standard Time, February 23, 1960, for furnishing four (4) 96-inch ring-follower gates for Glen Canyon Dam, Glen Canyon Unit, Arizona-Utah, Colorado River Storage Project. Delivery is desired within 450 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

OFFICIAL PROPOSALS

Bids: January 28, 1960

Soil Explorations and Foundation Investigations

NOTICE TO CONTRACTORS
STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Eastern Standard Time on January 28, 1960, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, New York for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON: WEST STREET TO HERALD PLACE ARTERIAL, CITY OF SYRACUSE, ONONDAGA COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. SM-150 . . . AND INTERSTATE ROUTE 570 BEAR STREET TO CLINTON STREET, NEW PROJECT NO. I-690-3(1)214, CITY OF SYRACUSE, ONONDAGA COUNTY WHICH CONSTITUTES CONTRACT SPEC. NO. FA-SM-152.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.

(b) Mr. E. E. Towlson, District Engineer, New York State Department of Public Works, 333 East Washington Street, Syracuse, New York.

(c) Mr. William Mende, Principal Building Construction Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.

The Engineer's estimate of cost for this work is $35,375.00.

Proposal for this contract must be submitted in separate sealed ennvelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $2,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF PUBLIC WORKS

Bids: February 18, 1960

The Sale of Salvage Rights At The Massena Canal (Alcoa) Power Plant Near Massena, St. Lawrence County, New York

POWER AUTHORITY OF THE STATE OF NEW YORK
ADVERTISEMENT FOR PROPOSALS
SPECIFICATIONS NO. PA-5-15081
ST. LAWRENCE CONTRACT NO. P 44

NOTICE TO CONTRACTORS: The Power Authority of the State of New York will receive sealed proposals from prospective purchasers of salvage rights at the Massena Canal (Alcoa) Power Plant, near Massena, St. Lawrence County, New York until 10:30 A.M. Eastern Standard Time on the 18th day of February, 1960, at the Authority's office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of equipment and material which the Salvage Contractor (purchaser of salvage rights(will be entitled to remove from the power plant site and which, after removal from the site, will become the property of the Contractor are as follows:

14 Generators, horizontal shaft, 500 volt, direct current:
- 12 units rated at 4400 amperes—140 R. P. M.
- 2 units rated at 7000 amperes—180 R. P. M.

4 Generators, vertical shaft, 500 volt, direct current, rated at 7000 amperes 100 R. P. M.

2 Generators, alternating current, 25 cycle, 2200 volts:
- 1 unit with horizontal shaft, rated at 3750 K. W.—140 R. P. M.
- 1 unit with vertical shaft, rated at 1240 amperes—100 R. P. M.

3 Overhead cranes, direct current electrically powered:
- 2—15 ton capacity cranes; spans—29-feet and 38-feet 11-inches
- 1—10 ton capacity crane; span—30-feet

Approximately 1,800,000 lbs. of scrapped turbine equipment

Approximately 550,000 lbs. of structural steel in crane supporting structures.

Approximately 120,000 lbs. of cast iron floor plates.

6 Steel headgates, each approximately 10½ feet wide by 30 feet high.

Dependent on the schedule on which the contract for salvage rights is awarded, all equipment and material which the Contractor desires to salvage shall be completely removed from the power plant site and from adjacent Authority-owned land on or before on of the following dates:

Schedule No. 1:	May 31, 1960
Schedule No. 2:	June 30, 1960
Schedule No. 3:	July 31, 1960
Schedule No. 4:	August 31, 1960

Plans, specifications and Proposal Forms for the salvage rights may be obtained from the Power Authority of the State of New York, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at no cost, upon written application. Plans, Specifications and Proposal Forms for the salvage rights will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with the instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the total amount of the bid.

The right is reserved to make award on any bid and to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

Bids: February 16, 1960

Narrows Bridge Cables and Suspenders

TRIBOROUGH BRIDGE AND TUNNEL AUTHORITY

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 A.M. Tuesday, February 16, 1960

For Narrows Bridge Contract No. NB-3, Cables and Suspenders. The bid must be accompanied by a deposit in the amount of $500,000.00.

Plans, specifications and contract documents may be purchased at the office of the Authority for $25.00, which will not be refunded.

Contractors Watch This Section—

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

EMPLOYMENT OPPORTUNITIES

DISPLAYED RATE:

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

FEBRUARY 4TH ISSUE CLOSES JANUARY 25TH

UNDISPLAYED RATE:

$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• POSITIONS VACANT

DESIGNERS

Make SURE of Your future!

McKEE

offers steady employment and opportunity for advancement. If your design experience has been in:

- STRUCTURAL
- PIPING
- SINTERING MACHINE DESIGN
- CONVEYOR DESIGN
- INSTRUMENTATION
- PRESSURE VESSELS
- MATERIALS HANDLING

for Steel Plants, Blast Furnaces, Open Hearths, Sintering Plants, Oil Refineries, Chemical Plants or other Heavy Industry.

Send detailed resume and photo to

G. VICTOR HOPKINS

ARTHUR G. McKEE & CO.

2300 Chester Ave. Cleveland 1, Ohio

GRADUATE ENGINEER

to take charge of a mid-west maintenance firm's construction division.

Prerequisites are:

- Registration for the State of Ohio
- Age 30 to 45
- Experience in Commercial & Industrial construction must cover Design, Estimating, Purchasing, Supervision and Direct contact with clients.

We provide base salary, car, bonus, compensatory program and have insurance and retirement program in effect.

Direct resume to

P.O. Box 1380, Columbus, Ohio

POSITION: Supervising Engineer, Transportation Planning and Engineering.
REQUIREMENTS: Civil Engineer who can assume responsibility for preliminary design and cost analysis for metropolitan highway system. Position requires imagination and ability to deal with urban highway location problems.
SALARY: $10,000 to $12,000 per annum, depending on qualifications.
PENN-JERSEY TRANSPORTATION STUDY
51st St. and Parkside Ave., Philadelphia 31, Penn.
(Attn: Robert S. Winchester, Administrative Officer)

CIVIL ENGINEER

Permanent new position for graduate civil engineer in the salary range of $511 to $588 a month (plus longevity pay). Candidates with outstanding qualifications may be hired above the minimum. Vacation, sick leave, dual pension program, and other fringe benefits. Must be U.S. citizen and possess an EIT certificate. Some related experience desired to work in design and construction of sewer, water, street, sidewalks, and curbs. Travel expenses paid on invitation and moving expenses paid for selected candidate. Personnel Dept., 404 City-County Bldg., Madison 9, Wisconsin.

CIVIL or SANITARY ENGINEERS — TWO —

- Starting Salary Open
- Career Opportunity
- Consulting Firm of National Reputation
- Advancement potential Unlimited
- Work Varied

Qualifications Desired: Top caliber men having engineering degree with minimum 8 years practical experience in planning, report writing, design and operation of sewage and industrial waste collection, treatment, and disposal facilities. Limited travel; location Pennsylvania area.

P-3239, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

CONSTRUCTION ENGINEER

An expanding midwest pharmaceutical company has an opportunity for a field engineer to keep in contact with the details of construction work such as proper backfilling, adequate piping testing, utility piping, all mechanical work, proper concrete mixes, etc. This man should have 4-10 years of varied experience in both mechanical and structural phases of construction. Write stating background and experience to:

Technical Employment Coordinator

THE UPJOHN COMPANY

Kalamazoo, Michigan

TOWN ENGINEER

Town of Montclair, N. J.

Suburban, Residential, Population 45,000

For supervision of engineering staff of Public Works Department; municipal construction, traffic engineering, reports, extensive contacts with public.

Requires engineering education and professional registration.

Salary range $8,000—$10,400.

Excellent working conditions.

Submit full details of background and salary requirements to General Superintendent of Public Works, Municipal Building, Montclair, N. J.

CONSTRUCTION MANAGER

With heavy experience background in dams, tunnels and hydroelectric projects. Work domestic or foreign. Salary commensurate with experience. Write:

P-3097, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

SALESMAN

Excellent opportunity with one of Philadelphias' oldest and largest distributors of Construction equipment.

SERVICE SUPPLY CORPORATION
20th and Erie Avenue Phila. 32, Pa.

Have opening for several recent Civil Engineer Graduates with military obligations completed who desire to learn the construction business. Ambitious, aggressive, dependable, use no intoxicants, willing to start in the field on industrial building and heavy construction, and willing to move. Must be single. We operate throughout Kansas and adjacent states; offer excellent opportunity for advancement. Top wages. Martin K. Eby Construction Co., Inc., P. O. Box 1679, Wichita, Kansas.

Bridge Design Engineer, who is able to take charge of project from inception to completion. Salary open. Apply Ivan R. Bray, Director Personnel, City Hall, Sioux City, Iowa.

Senior Sanitary Engineer to act as consultant to public and private officials in the state on matters of sewage treatment and disposal, water supplies and treatment plants. Requires engineering degree and 3 years' experience in the above or equivalent combination of experience and training. Send complete resume to B. Dearington, Connecticut State Department of Health, State Office Building, Hartford, Connecticut.

Wanted—Civil Engineer or one who has had the equivalent training by practical experience. Must be familiar with the handling of sewer, water and paving projects and have $15,000.00 to $20,000.00 to invest in old established construction company. P-3422, Engineering News-Record.

Construction Superintendent — Willing to travel for permanent position with fast growing Building Contractor. At present have positions open in the Midwest. Please submit complete resume with salary requirements to P-3420, Engineering News-Record.

Opening for Asst. or Assoc. Prof. interested in Soil Mechanics, M. S. or Ph. D. required. Feb. 1, 1960 or Sept. 1, 1960. Apply chmn. Dept. of Civil Engineering, Univ. of Nebr. Lincoln, Nebraska.

Sales Engineer: To represent expanding prestressed concrete plant in Southeastern Wisconsin area. Structural design background in building field considered helpful. Send complete resume and salary requirements to P-3492, Engineering News-Record.

Civil Engineer—capable of supervising civil engineering department in established consulting engineering firm. Experienced in water and sewerage facilities, municipal work and surveying. Must have sales and organizational ability to expand present department. Salary commensurate with ability. P-3495, Engineering News-Record.

One Chief of Party—Must be capable of handling survey parties and have thorough understanding of municipal survey work pertaining to rights of way, curb and street line and grade, sanitary and storm sewer survey plans and profiles, and general survey work. Apply for appointment—Office of Township Engineer, 1 Main Street, Woodbridge, N. J., between 9 A.M. and 5 P.M.

One Transit Man—For inside drafting room and outside field work. Must have thorough knowledge of engineering, drafting and calculating, and be thoroughly familiar with deed and conveyance, and tax map work. Apply by appointment—Office of Township Engineer, 1 Main Street, Woodbridge, N. J., between 9 A.M. and 5 P.M.

Two Jr. Engineering Aides or Chainmen—To work in survey parties. Apply by appointment—Office of Township Engineer, 1 Main Street, Woodbridge, N. J., between 9 A.M. and 5 P.M.

Plant Superintendent for Structural Steel. Fabricating and Erection Company—20,000 ton capacity. To take complete charge of fabrication of structural steel for commercial, institutional and industrial buildings in Eastern States. Minimum requirements five years experience, supervising shop employing approximately 100 personnel. Send complete resume, listing all employment, experience, education and salary requirements. P-3447, Engineering News-Record.

(Continued on opposite page)

• POSITIONS VACANT

(Continued from opposite page)

Electrical Engineers—Competent to check design and to supervise installation for new construction and renewing old distribution in large steel mill. Some field design may be necessary. Long term project with Consulting Engineer. Apply by Air Mail sending brief resume of education and experience to Box 751, Whiting, Indiana.

Mechanical Engineer—For permanent position in office of long established large Engineer-Architect firm. Must be experienced in all phases of mechanical design for schools, commercial and light industrial buildings including heating, plumbing and air conditioning. Send complete resume to Employment Manager, 3600 East Jefferson, South Bend 15, Indiana. All replies will be acknowledged.

Construction Estimator—Contracts Manager —Graduate engineer, 12 to 15 years experience in competitive estimating, contracts, field supervision, industrial construction and management. Office procedures and overseas construction experience a distinct asset. Salary open. Permanent position. Please send resume with recent photograph. P-3476, Engineering News-Record.

• POSITIONS WANTED

Electrical Engineer, BEE, Reg PE, 37, 14 years diversified experience in industrial power and control, power distribution, and petroleum-electric fields. Will complete fourth foreign contract in March. Speaks French, Spanish. Seeks position with engineering-construction firm. PW-3352, Engineering News-Record.

Superintendent, Project Mgr., Proj. Engineer, age 48, heavy constr., water works, dams, refineries, grad. registered engineer, US citizen, speaks French, Spanish, German, Dutch, prefers foreign assignment. T. deBruyn, Rte. 1, Box 246-A, Las Vegas, Nevada.

Wanted: Employer in heavy construction civil eng., age 29, married, ambitious industrious very anxious to learn. PW-3316, Engineering News-Record.

Executive: Project management. Contract Negotiations & Administration, Claims. 23 yrs. exp. bridges, waterfront, highways, earthwork, etc. U. S. & O. S. PW-3380, Engineering News-Record.

Reinforcing Steel Estimator-Detailer, twelve years. Three years supervisory. To locate West or Southwest. PW-3397, Engineering News-Record.

Registered Engineer 20 yrs. experience, can assume immediate full charge all phases of water or sewer projects any size; U.S. or foreign. PW-3401, Engineering News-Record.

Construction Supt. 32 years of construction experience in Commercial, Public and Industrial. Will assume responsibility with integrity. Location preference Southeast—best references. PW-3144, Engineering News-Record.

Project Manager or General Superintendent, fully experienced in all phases of heavy construction, bridges, cofferdams, caissons, all types pile. Mass rock and earth excavation, throughways, railroad construction. Availability—immediately. Will relocate. Phone, Poplar 8-1058, South Charleston, West Va. PW-3396, Engineering News-Record.

Reg. Civil Engineer & L. S.—Age 38 10 years responsible charge munic. eng'r.—land reclamation & development. Highways-drainage. Desires association northeast firm. PW-3424, Engineering News-Record.

B.S. C.E.—29 single—2 years field experience—some office work, take off, checking shop drawings, etc. Desires work with General Contractor—will consider overseas assignment. Please state salary range, location. PW-3435, Engineering News-Record.

Attention General Contractors: Chief Estimator and/or Project Manager available for immediate connection. Proven record of four to six million volumn per year in strict competition. Minimum, salary required $12,-000.00 per year. Contact William C. Dick, 3507 Cardinal Blv'd., Daytona Beach, Florida. Phone—Clinton 3-9955.

Supt. or General Foreman—Age 43—Over 18 years experience highway construction supervising earthmoving equipment, excavating, drainage. Know men, methods and cost. Available at once. A-1 references. PW-3461, Engineering News-Record.

• POSITIONS WANTED

Construction Manager, hvy. const. Desires position with med. sized firm reasonably financed. Engr. background, age 41, exper. U. S. & O.S. all types contracts. Excellent contacts. Good following of personnel. Now employed. Available 90 days. PW-3437, Engineering News-Record.

General Supt. 43, 20 years experience on heavy industrial, commercial, chemical and institutional work. Engineering background. PW-3440, Engineering News-Record.

Executive age 43 Construction Manager 25 yrs experience Highway Airport Sewers Large Industrial Installations. U.S.A. or Foreign. PW-3390, Engineering News-Record.

Executive Management/Field Supervision. Owned firm 15 years; Sewers, Sheeting, Wellpoints, etc., Water. Estimates, Purchasing, Planning, Completion. Age 37, Top References, Surety, Bank, Engineers. Desire West of Miss. or foreign. PW-3395, Engineering News-Record.

Construction Supt. General Construction. PW-8896, Engineering News-Record.

Executive-Construction Equipment — Over thirty years experience in highway and heavy construction. Last 12 years head of equipment division of large heavy construction co. Have ability and experience to handle equipment specifications, purchasing, financing, accounting, management of large organization, and ability to cope with all maintenance problems regardless of the most difficult field conditions. PW-3451, Engineering News-Record.

Chief Highway Engineer—Broad experience in design and construction of expressways, parkways and municipal facilities. Registered P. E. in many States. Desires key position with engineering organization or contractor. Now located New England but will consider other locations in U. S. PW-3496, Engineering News-Record.

Construction Supt. General Construction. Would like to permanently relocate in the far west, or south west. 8 years with present Gen. Contr. in the east. Experience mostly schools. Cost conscious, experience in quantity surveys, cost reporting, and field engineering. Running school job at present time, PW-3471, Engineering News-Record.

Project Manager—Nuclear Power and Research Reactor experience, desires connection with architect-engineer-contractor. Currently employed by major reactor company. BSME-MIT; also CE-Georgia Tech. Regisered Engineer. Age-38. PW-3487, Engineering News-Record.

• POSITIONS WANTED

C. E. Executive. 8 years heavy, marine, pipeline, road, foreign construction and sales experience. Speak several languages. PW-3513, Engineering News-Record.

Structural Engr.—MSCE—26—2 yrs. experience in structural design. Interested in consulting field. Foreign position acceptable. Resume upon request. PW-3456, Engineering News Record.

Construction Engineer, experienced in Water, Sewer and Gas lines, Water and Sewage Treatment plants, Street and Highway construction on Municipal, State and U. S. Gov. contracts. 4 years Civil Engineering, 6 years Estimator and Gen. Superintendent, 2 years Management. Rocky Mtn. area or Western U. S. PW-3465, Engineering News-Record.

Civil Engineer—10 years experience general construction. Supervision, liaison, expediting, owners' representative. Some estimating. Married. Will relocate. Preferably West Coast. Resume available. PW-3479, Engineering News-Record.

Estimator & Project Manager. 7½ years experience in commercial, industrial, and institutional construction. PW-3475, Engineering News-Record.

Civil Engineer—has wife, 3 kids and 2 dogs. Wants high paid soft job to support dogs. 10 years experience in general construction. B. Sinclair, 25322 Kildare, Southfield, Michigan.

C.E.: Reg. P.E.: 37. Broad office and field exp.—supervisory and adm. capacity—airports, highways, dams and public bldgs. Design, specifications and estimates. Grading, drainage, sewer, water, paving, soils and materials control, reinf, and mass concrete. Desires responsible position at administrative level. PW-3493, Engineering News-Record.

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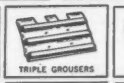

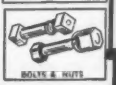

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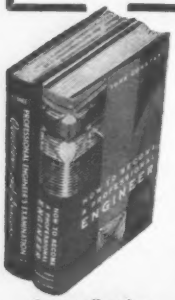

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Is That Trip Necessary?

DURING THE WAR YEARS when existing transportation facilities were overtaxed and there was no possibility of expanding them, it was in the national interest to discourage travel. To apply such a philosophy today, however, when advancing the nation's growth and satisfying the people's desires are both so dependent on improved transportation facilities, would be the height of folly.

Yet there are those who, unaccountably, still adhere to this misguided philosophy, or at least aid and abet it by their proposals and actions. These proposals, particularly as they relate to highway transportation, are most often motivated by the problems of traffic congestion or financing procedure, but in any case they reflect myopic views of the nation's needs.

The New York State Director of Transportation, for example, has suggested tripling tolls on crossings into New York City from New Jersey, not for any economic reason, but just to discourage travel into congested midtown Manhattan. If this is to be an objective, travel everywhere could be discouraged by purposely making roads inadequate and difficult to use. This bizarre idea was actually proposed in a report to the London County Council last year. The road system should be improved, it said, "but if possible without attracting so many vehicles that the benefit of the improvement is lost."

Like the problem of congestion, that of financing an adequate road system also spawns proposals based on an acceptance of restriction of travel rather than its expansion. One such proposal is that of Senator Harry F. Byrd to hold down the size of the Highway Trust Fund (which Congress set up to finance the Interstate Highway program) to those dimensions that it could attain without being fed by last year's one-cent federal gas tax increase and by any revenue from general taxes. In effect, Senator Byrd would freeze federal highway aid at the level fixed by user taxes existing at the time the Highway Act of 1956 was passed, regardless of highway needs and changing requirements.

This is in fact, the idea embodied in the Byrd Amendment to the Highway Act, which makes it so inflexible as to be unrealistic. Nevertheless, Senator Byrd apparently still favors it, for he has recently made public an exchange of correspondence with Commerce Secretary Mueller, in which he urges absolute adherence to the amendment by removing the extra one-cent gas tax and prohibiting any further use of general tax revenues for roads.

In his letter the Senator uses such terms as "reckless highway financing policies" and "inexcusable mess" and implies that the increase in cost estimates from the original rough figure of $23 billion used by the Clay committee to the present $39.9 billion is due to waste and extravagance. Rather supinely, it would seem, Secretary Mueller expressed general accord with the Senator.

There is nothing very edifying in this correspondence with respect to a recognition of the highway needs of the nation. Even worse is an editorial in THE WALL STREET JOURNAL commenting favorably on Senator Byrd's views of the highway program. Without even the qualifications that the Senator makes, the editorial generalizes that it is "a vast program thrown together, imperfectly conceived and grossly mismanaged, and in due course becoming a veritable playground for extravagance, waste and corruption." Nothing remotely resembling this description can be fairly applied to the highway program, so to find this view presented with such seeming satisfaction is disturbing. It is further evidence, and from a surprising quarter, that highway needs of the nation and contributions that highways can make to economic growth are being viewed through the wrong end of a telescope.

There are real problems to be solved in providing the nation with adequate highways—and railways, too, for that matter—but solutions that would restrict travel are not worthy of consideration. It will be a sad day if in peacetime we have to worry about such a question as "Is that trip necessary?"

Sheet Metal for Bridges

AN IMPORTANT EVENT in the history of bridge development will take place this spring when New York State receives bids for two bridges to be designed and built with light-gage aluminum space framing (see p. 38).

An opportunity to determine the practicality of such space frame design has been awaited since the full-scale load tests were completed at Lehigh University (ENR Sept. 4, 1959, p. 25). Now New York State is going to supply it. Initial cost of these first structures is not expected to be low, but some savings in maintenance costs are anticipated.

Compared with steel or concrete structures, the proposed bridges are extremely lightweight. The space frame design takes advantage of the high strength-weight ratio of properly braced sheet metal. Furthermore, the space frame is designed for composite action with the concrete roadway slab.

Disadvantages include the relatively high price of aluminum; more fabrication, especially of nonload-carrying bracing and stiffeners; lack of standardization of components; unfamiliarity of designers and contractors with this type of construction; and certain characteristics of aluminum, such as a higher thermal coefficient of expansion and lower modulus of elasticity. These, however, are not insurmountable barriers.

If this experiment should prove successful, it might well be a turning point in the history of bridge construction. It will mark the entry of light-gage metal into a field up to now almost exclusively the domain of heavyweights.